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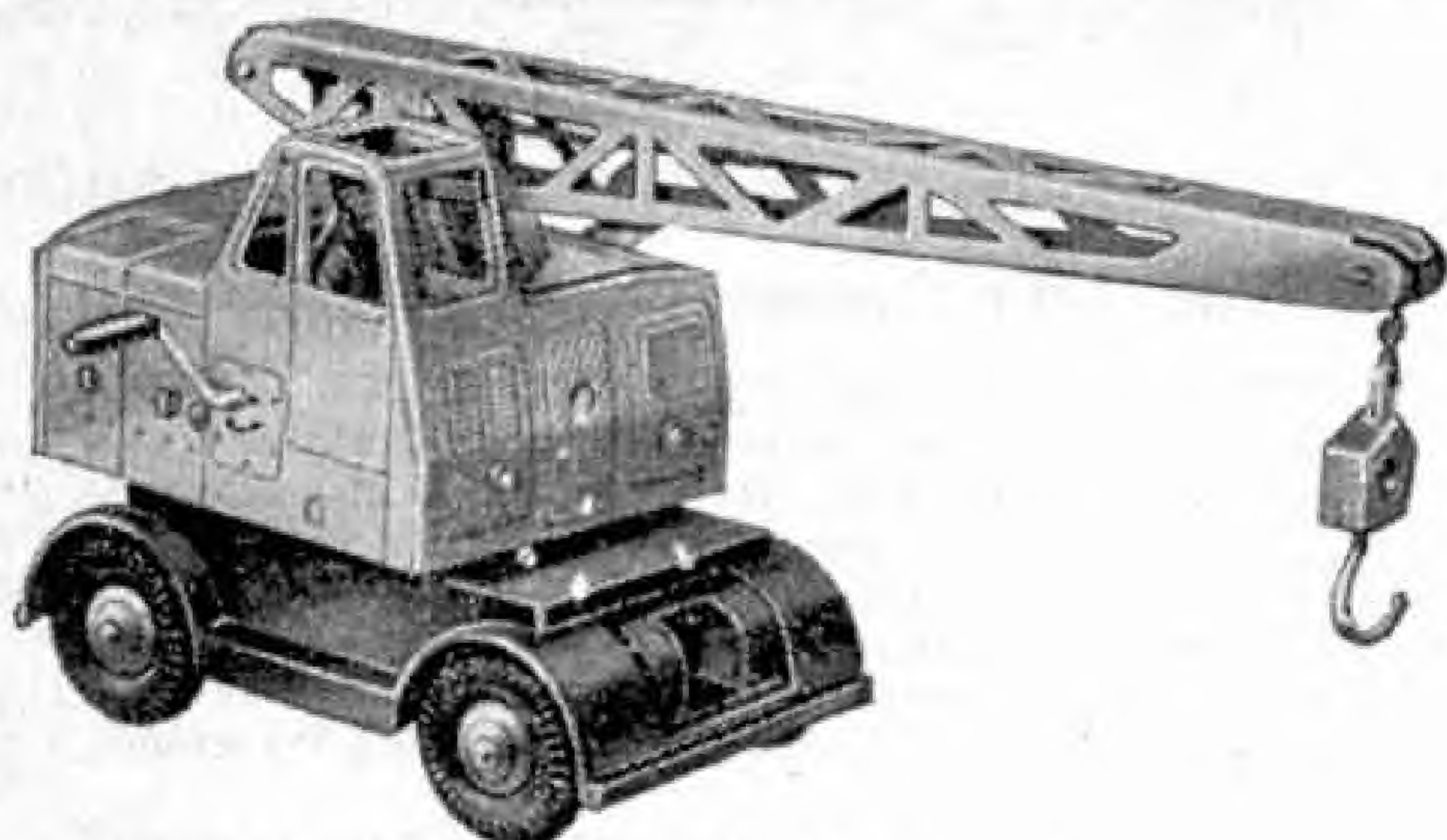


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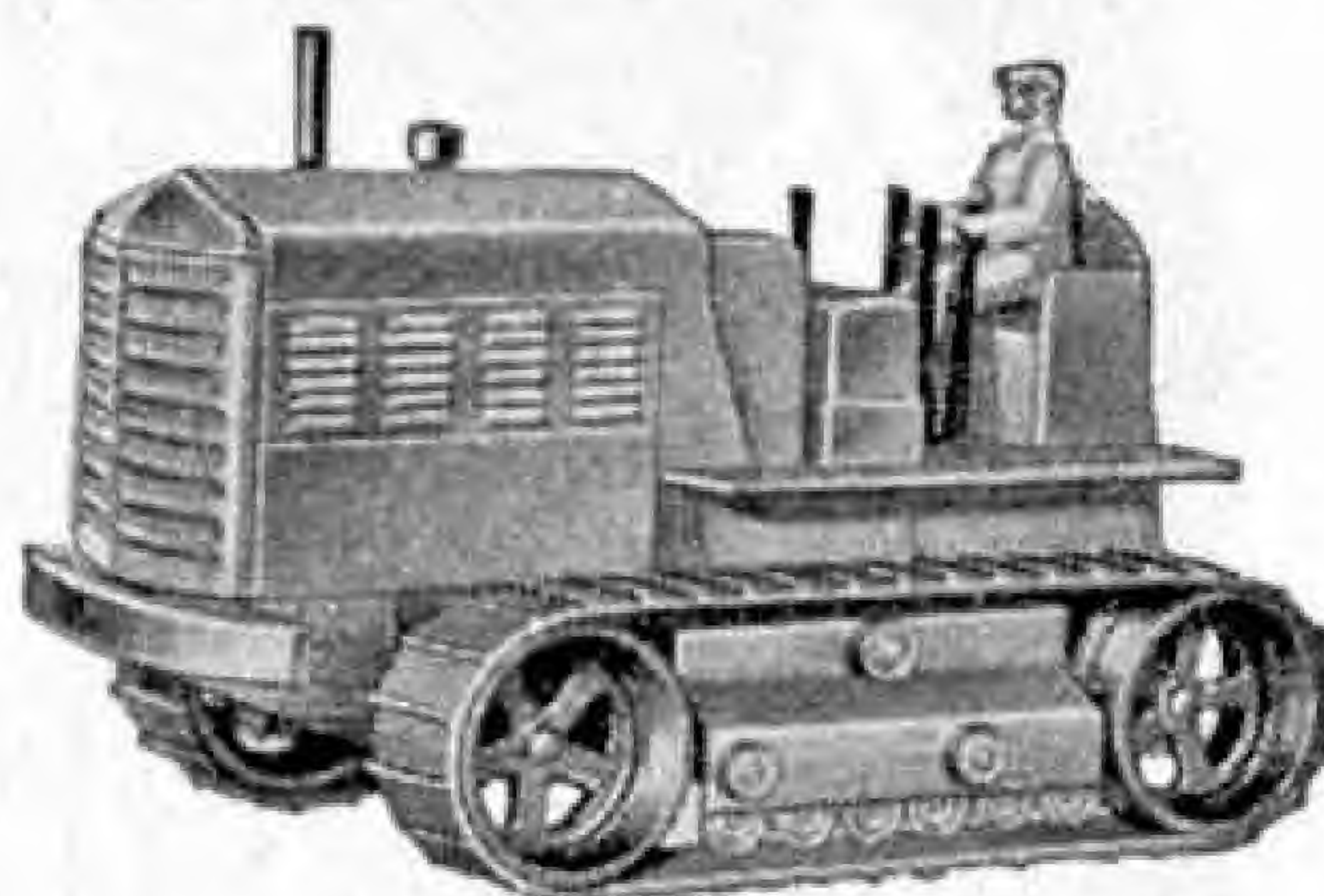
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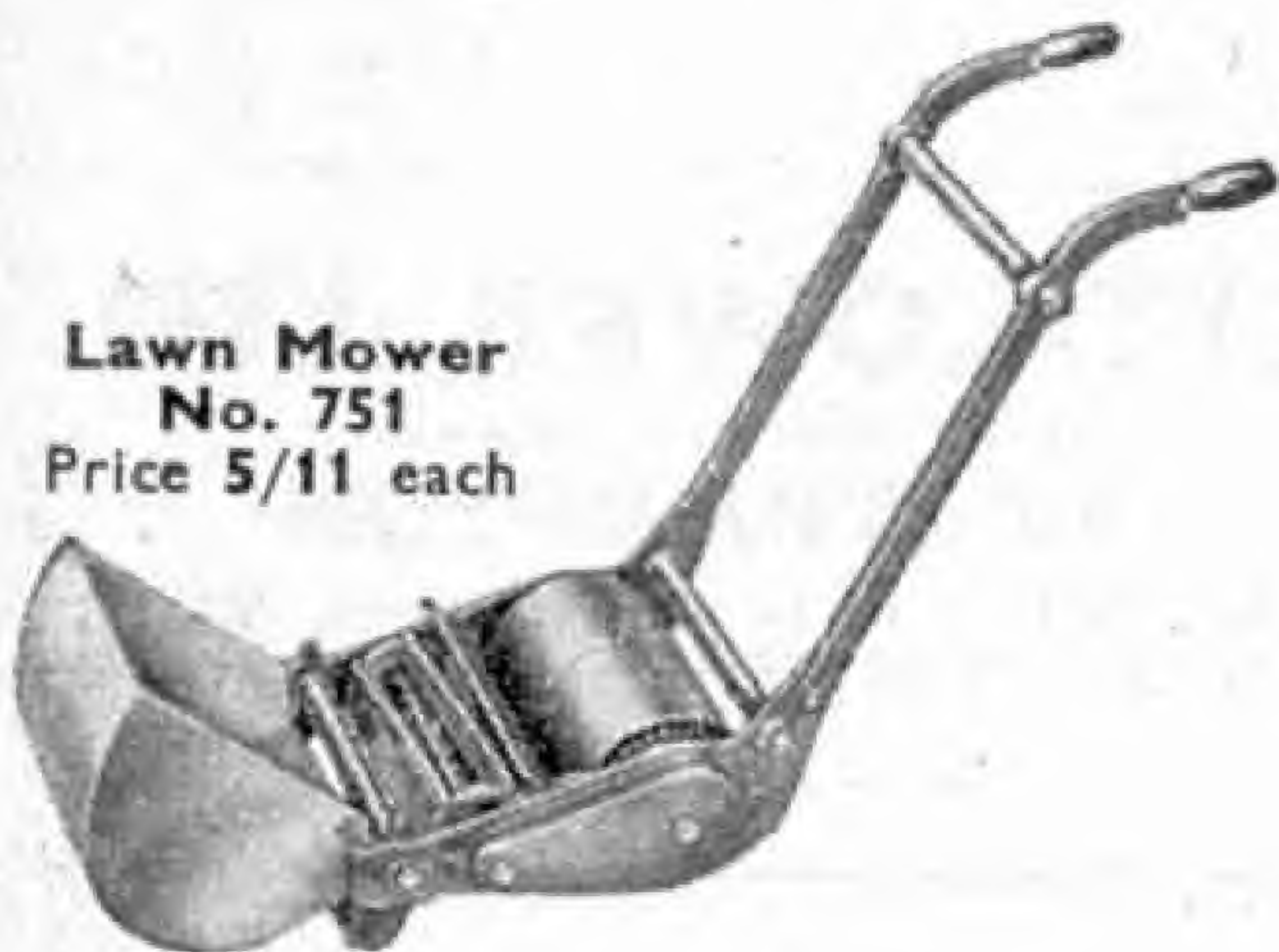
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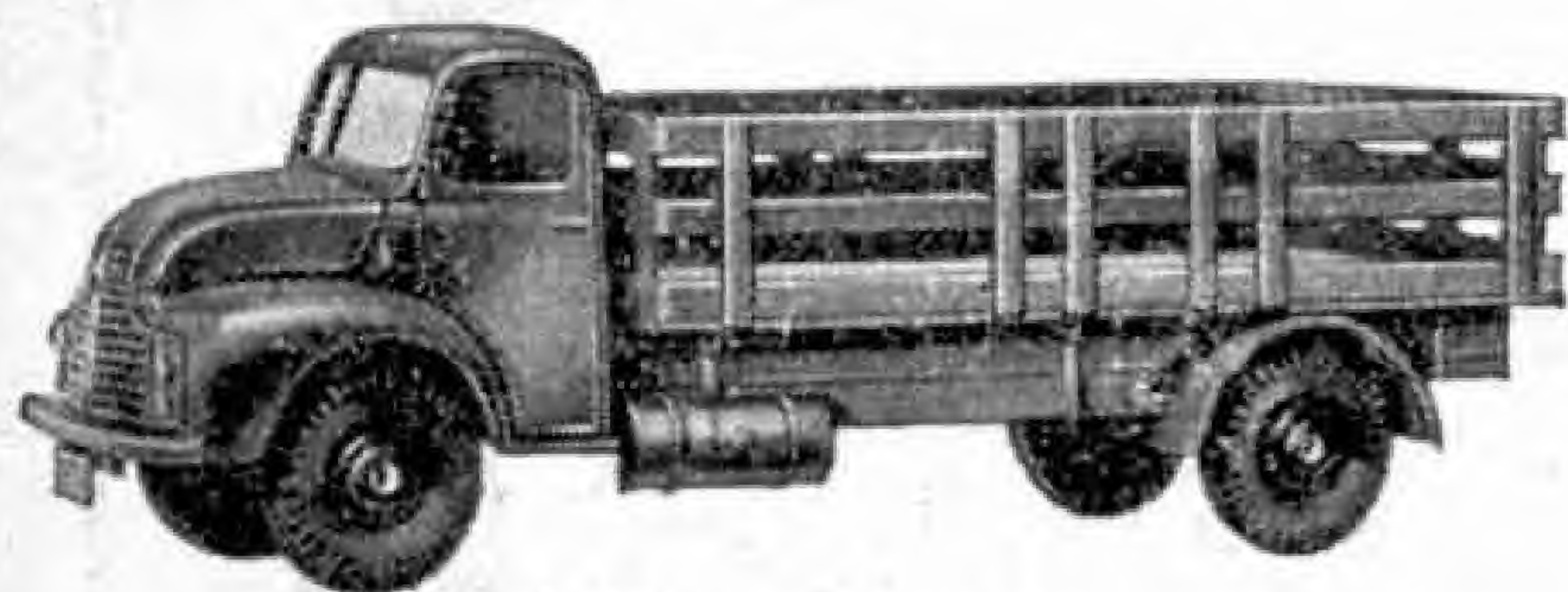
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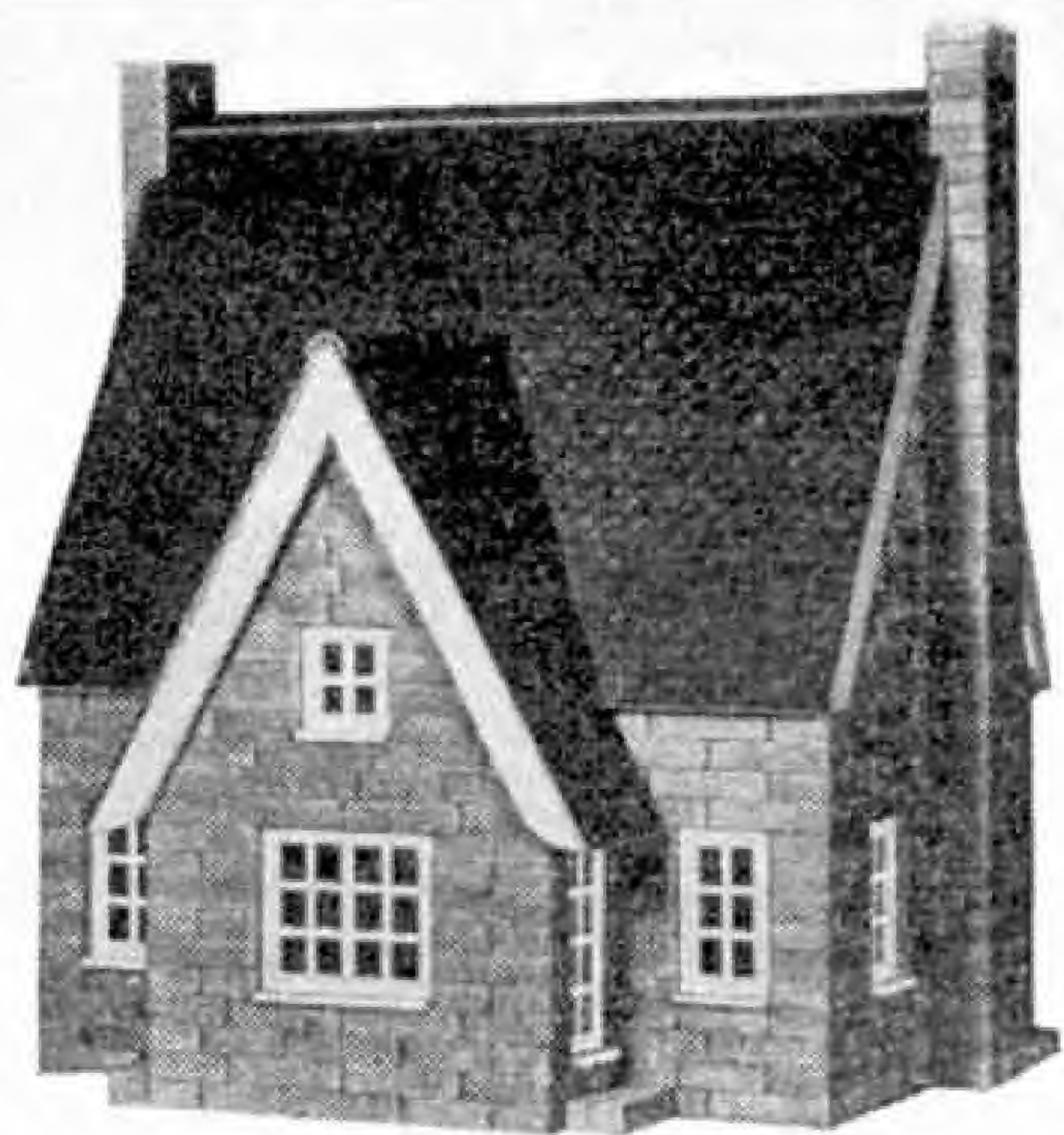
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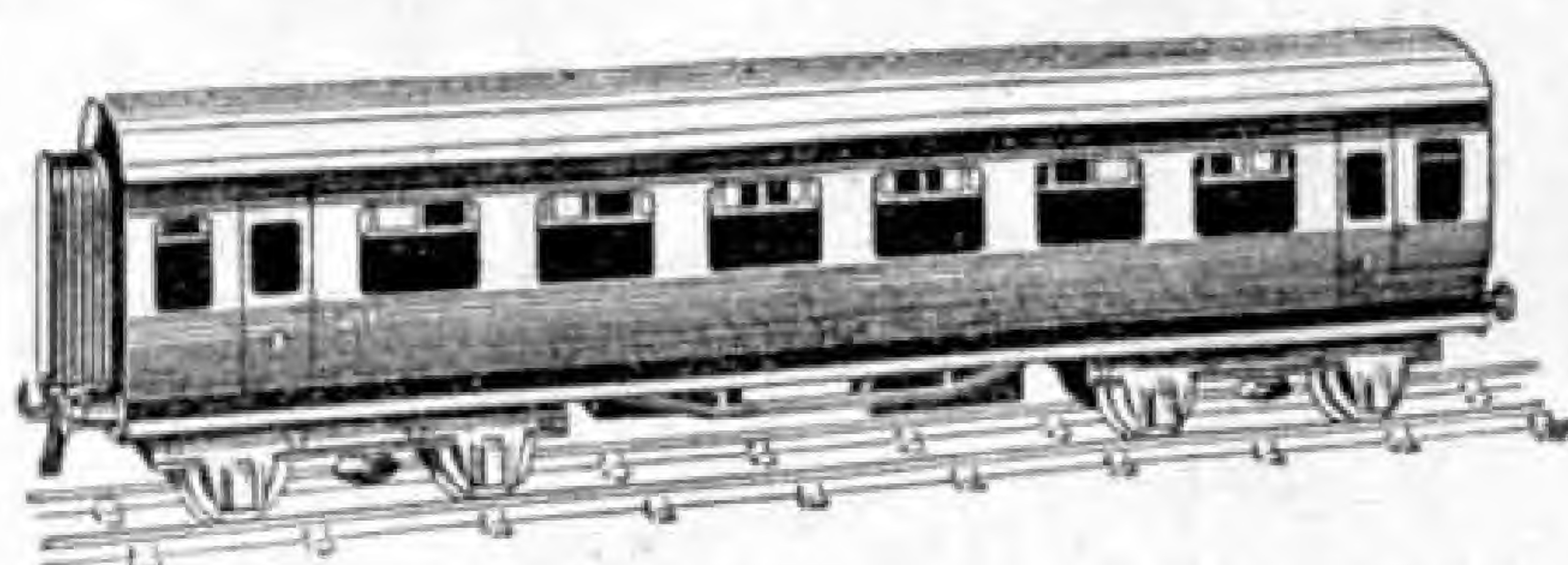
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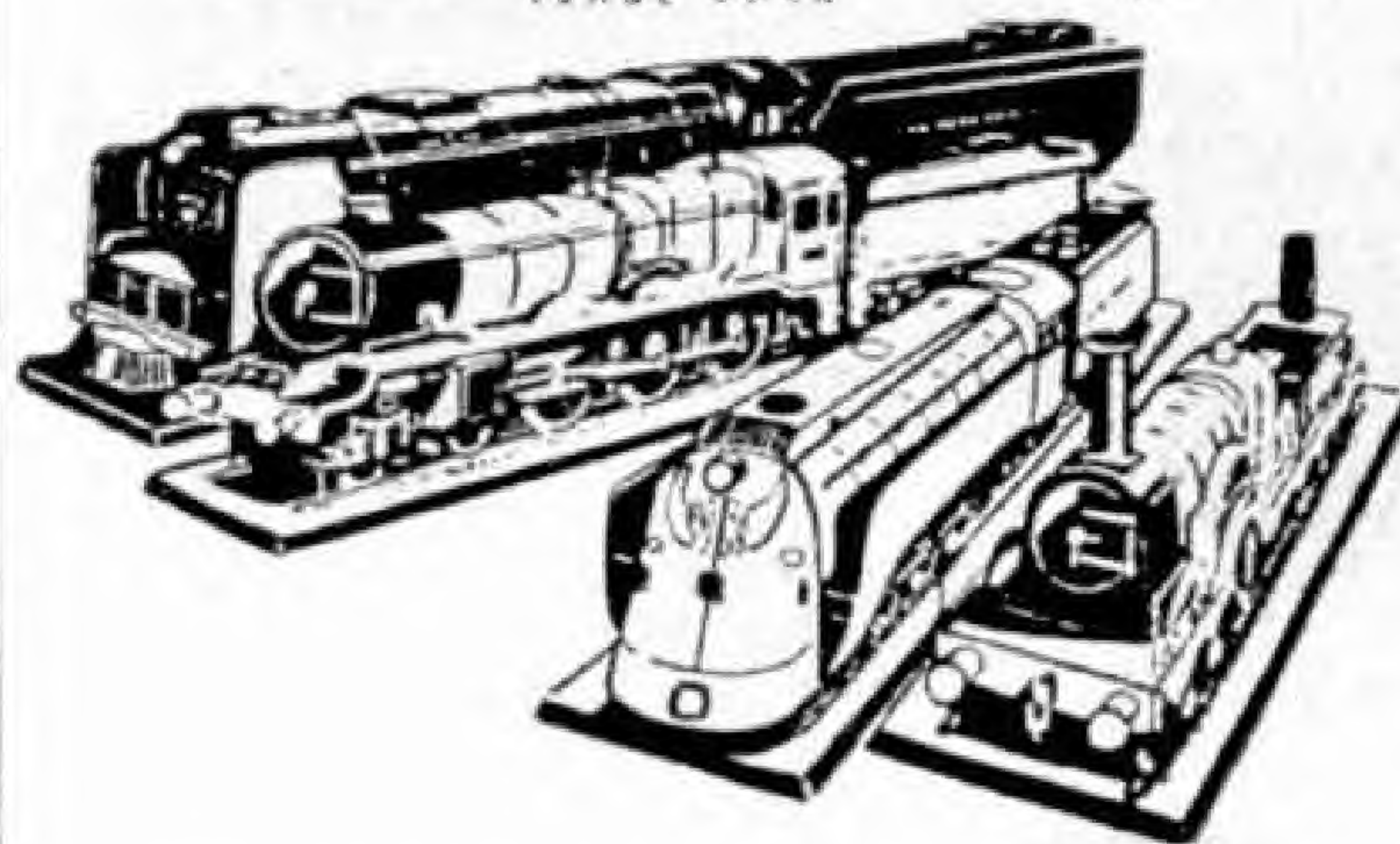
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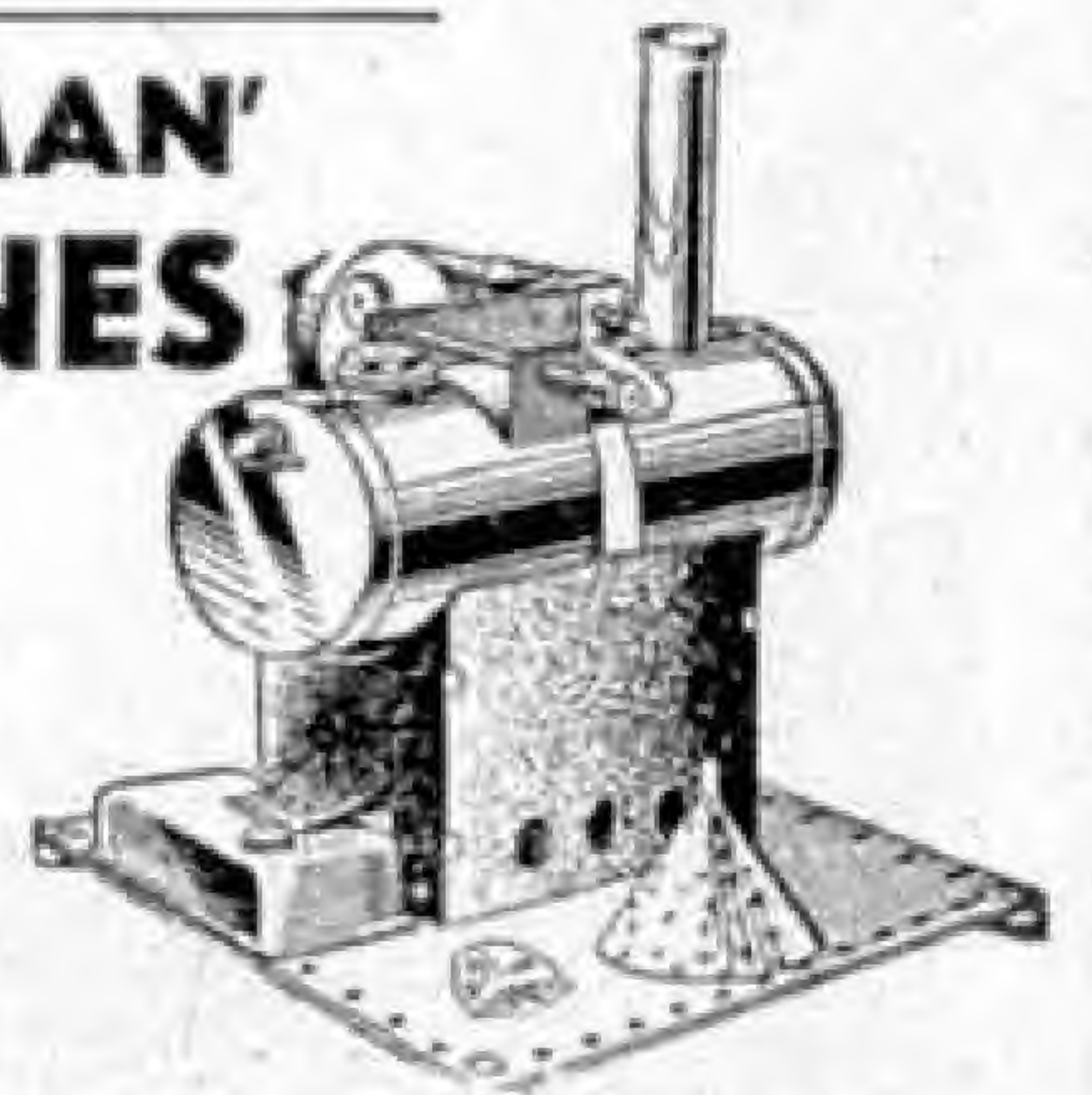
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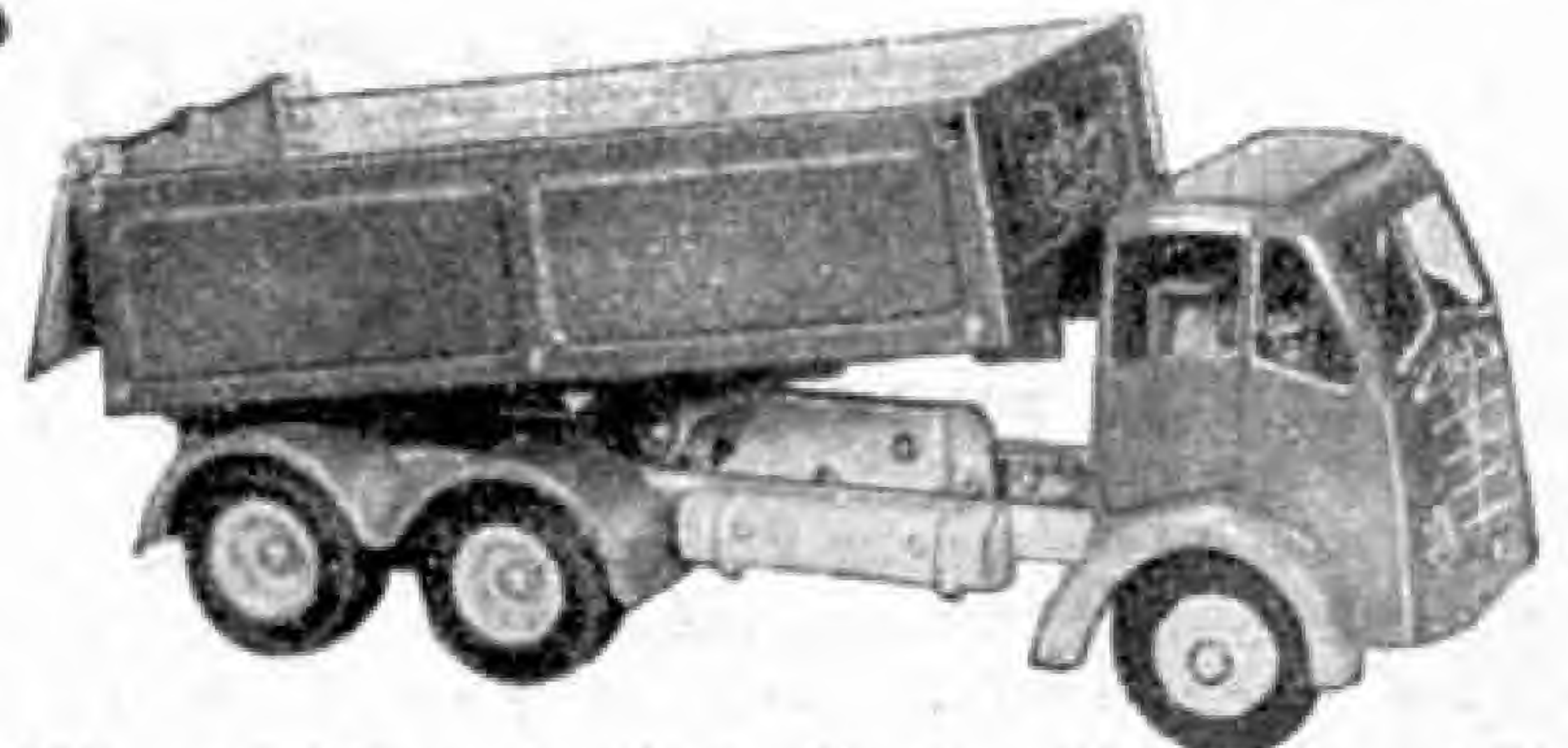
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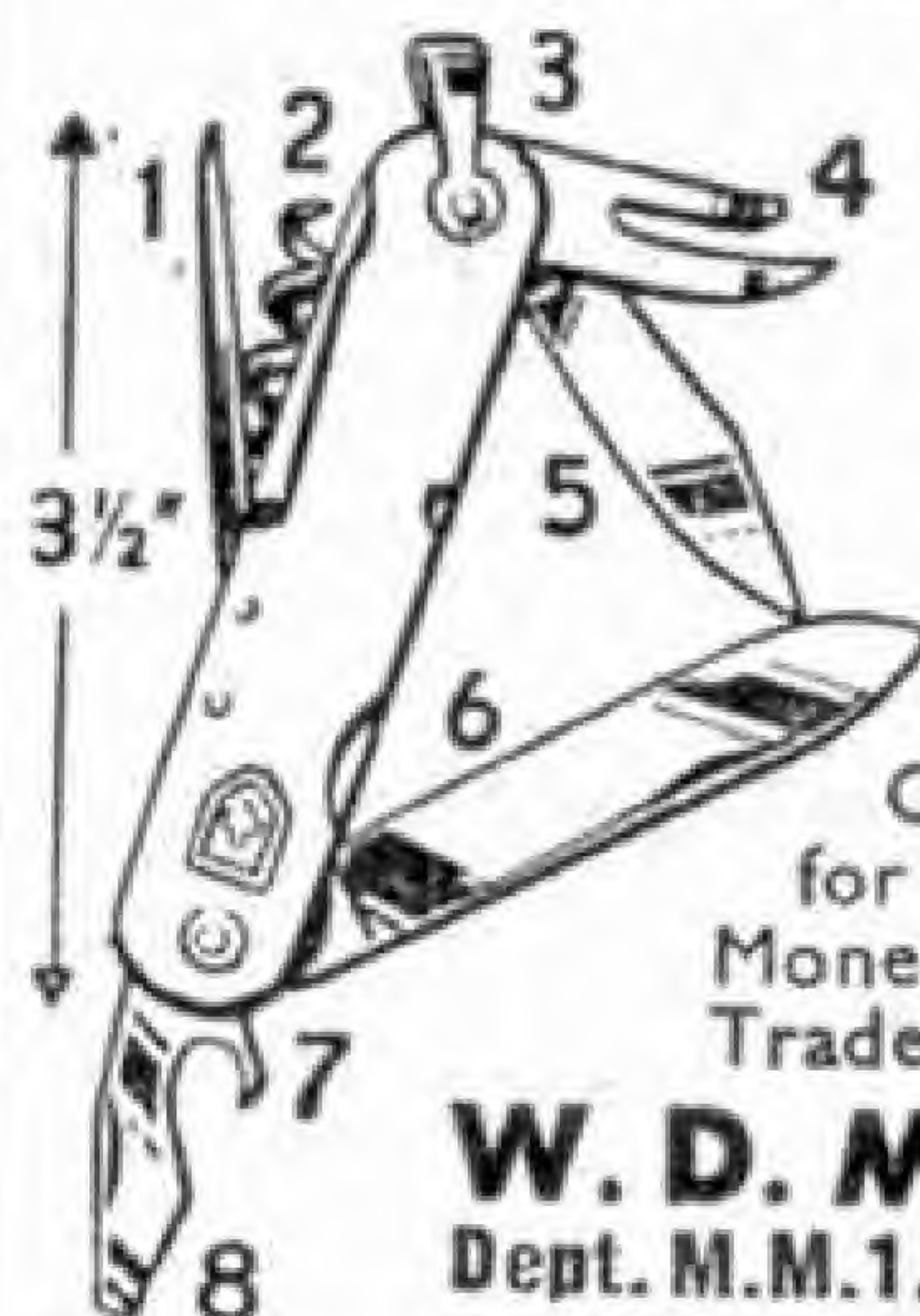
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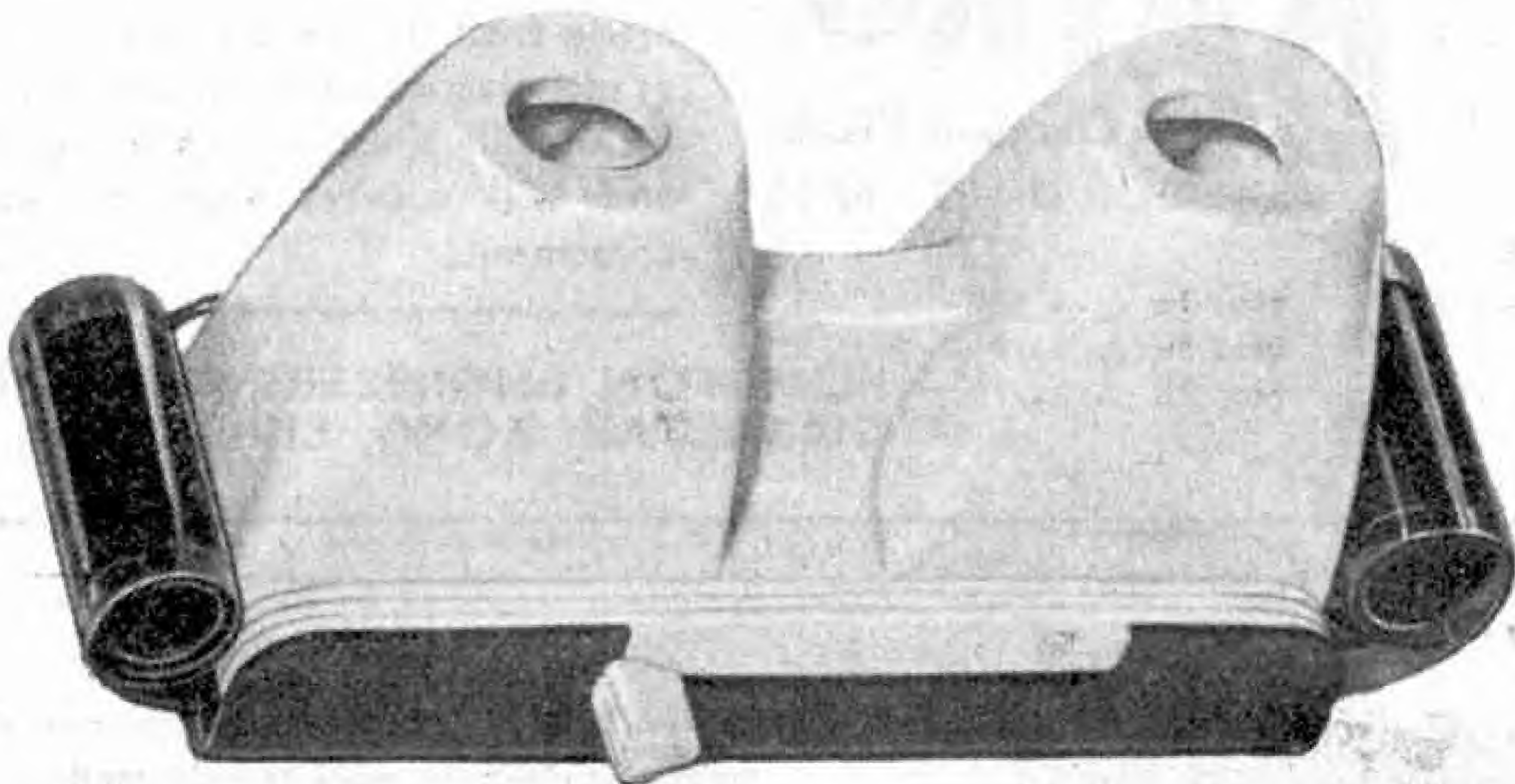
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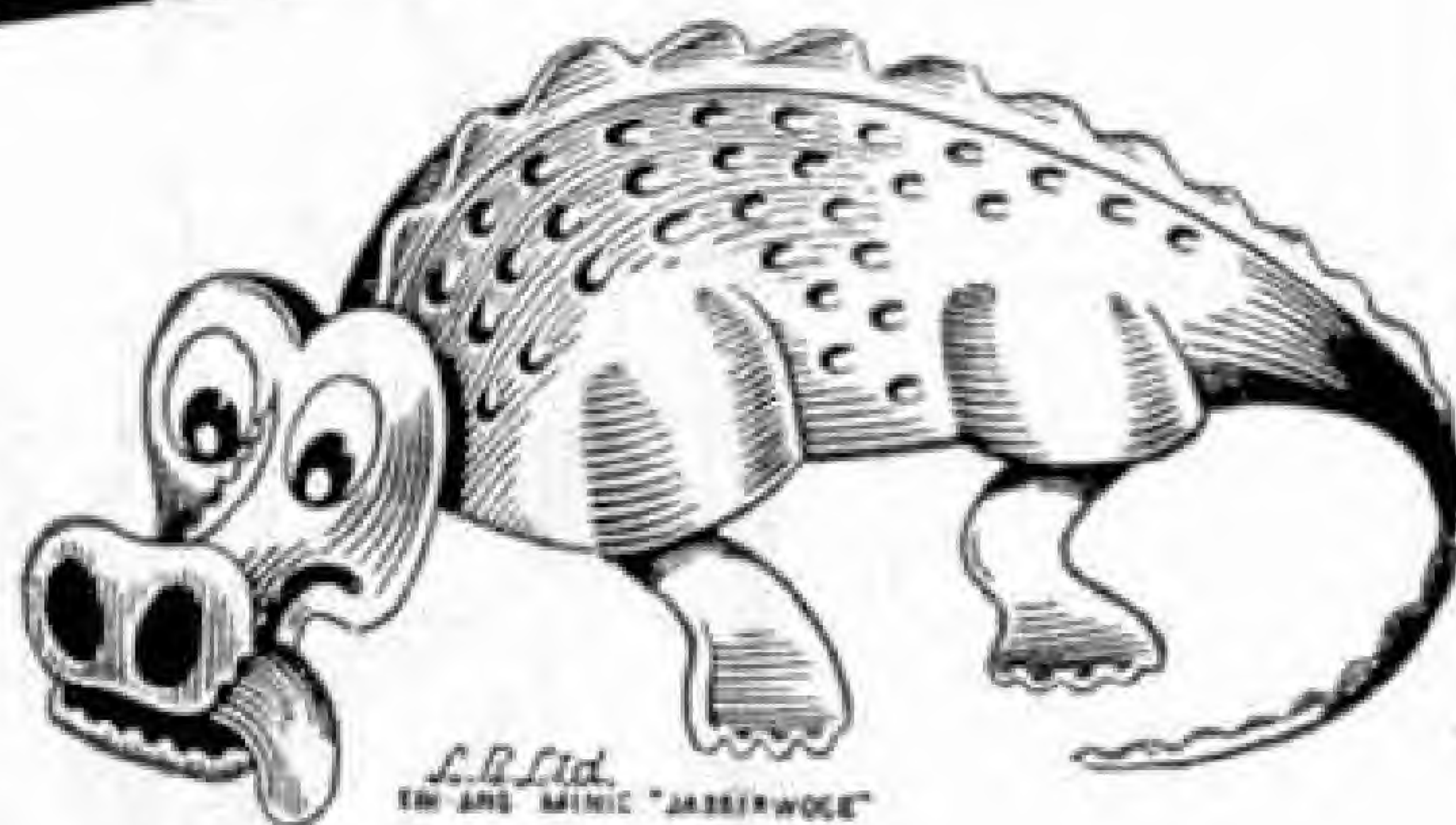
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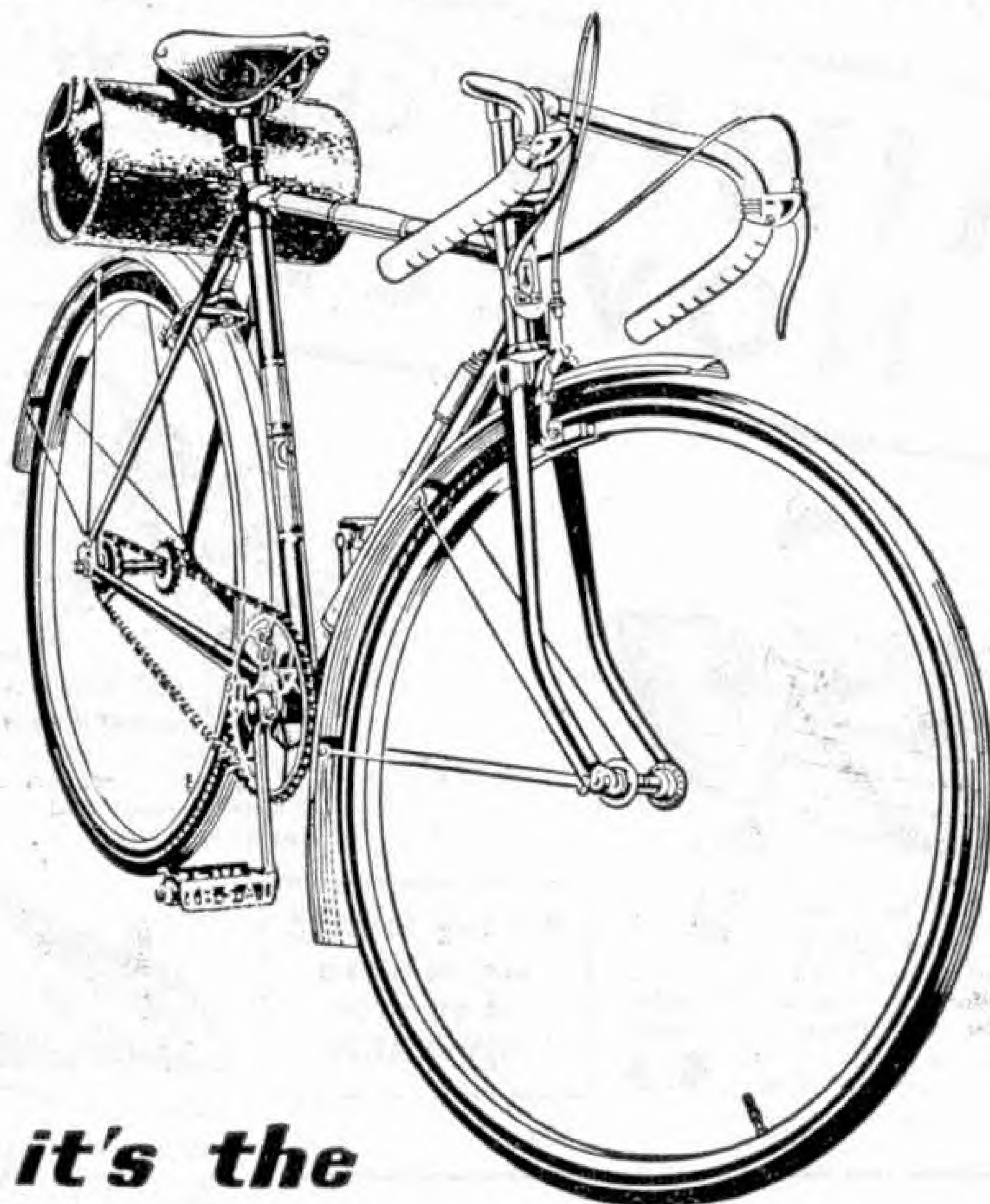


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Vol. XXXVI
No. 3
March 1951

With the Editor

New Pennsylvania Trains

I have been reading with interest the December issue of "*The Mutual Magazine*," the official publication of the "Mutual Beneficial Association of Pennsylvania Railroad Employees, Inc." The P.R.R. is one of the greatest of the fine railways in the United States and the magazine gives an interesting picture of the enthusiasm of the employees. We are told that: "Every person in the United States and numerous residents of foreign lands are considered as potential customers of the P.R.R."

From an engineering point of view one of the most interesting developments is a completely new "*Congressional*," the P.R.R.'s famous New York-Washington express, and a completely new "*Senator*," the almost equally well-known daylight train between Washington, New York and Boston. A total of 66 new cars will be required for the four trains in these services, and these cars will embody many striking innovations in travel comfort and convenience. Both trains will be hauled by fast and efficient electric locomotives.

Plans for the new trains have long been under consideration, but were delayed first by the war and the shortage of materials, and then by the road's huge programme of new and rehabilitated freight car and locomotive equipment which is now well under way. With new and modernised freight cars now going into service at the rate of 260 a day, it was decided to go forward with the new trains.

The "*Congressional*," fastest train in the Washington-New York service, leaves Washington daily at 4 p.m., serving Baltimore, Wilmington, Philadelphia, and Newark, arriving in New York at 7.35 p.m., on a three hour and thirty-five minute schedule. It leaves New York

daily at 4.30 p.m. and arrives in the Capital at 8.05 p.m., also a three hour and thirty-five minute run. The "*Senator*" leaves Washington daily at noon, serving Baltimore, Wilmington, Philadelphia, Newark, New York, and New England cities, reaching Boston at 8.40 p.m. Southbound it leaves Boston at 11 p.m., arriving in the Capital at 7.15 p.m.

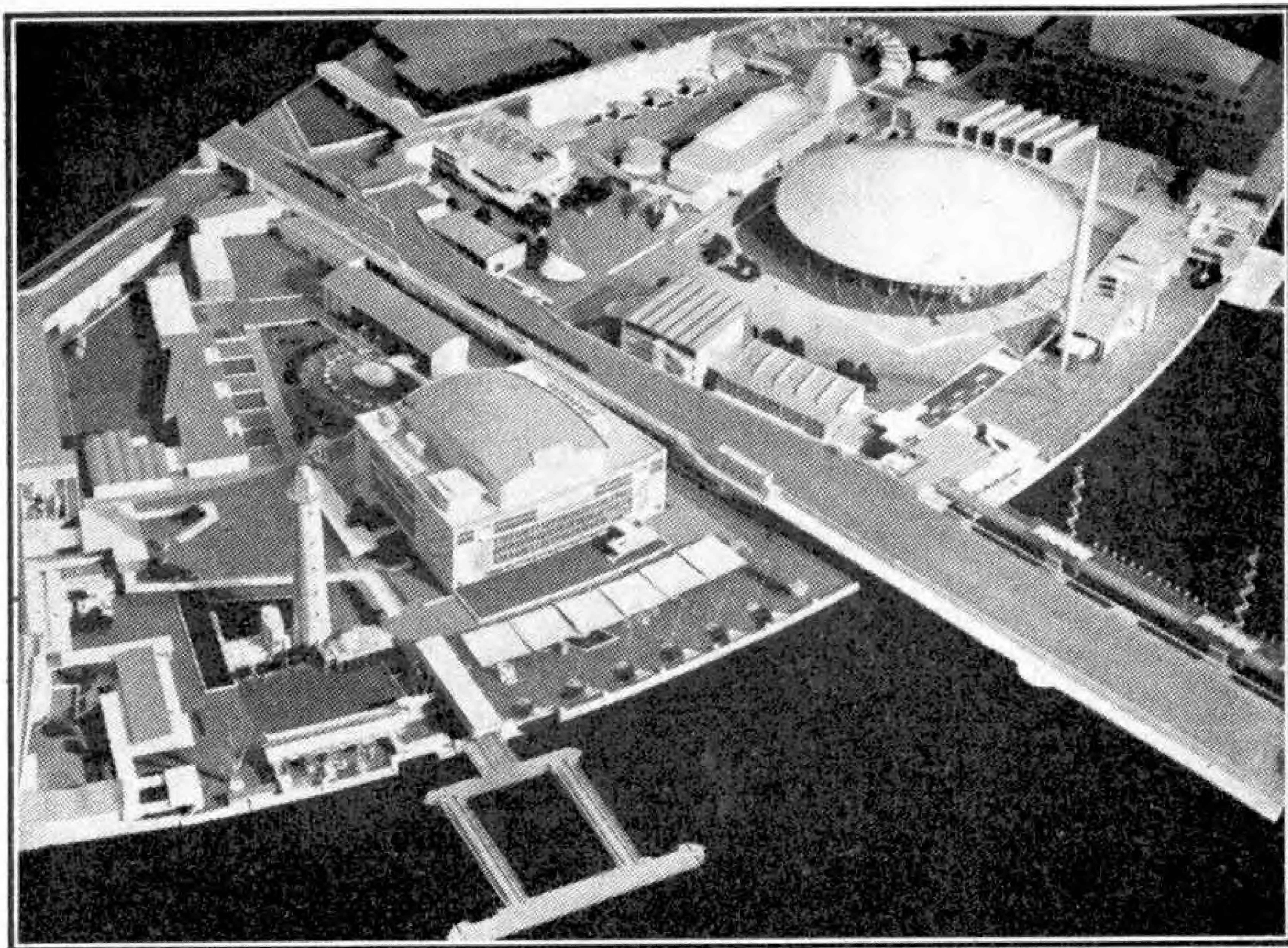
* * *

Next month I shall publish a novel article by Mr. C. G. Grey, who is well known to "*M.M.*" readers, in which he claims that air transport will not attain its highest efficiency until the development of the rotorplane, or rotorbus, capable of operating from main airports to small landing grounds at any town within 100 or 150 miles.

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The South Bank Exhibition of the Festival of Britain, 1951, as it will appear when completed.

The Festival of Britain

London's South Bank Exhibition

By W. H. Owens

ALTHOUGH every part of the country will contribute to this year's Festival of Britain, the central attraction is to be the South Bank Exhibition by the Thames in London. Here some 30 main buildings will form an excitingly modern landscape of colour and design on the riverside site between Westminster County Hall and Waterloo Bridge. The Exhibition grounds are divided into two sections by the Hungerford Railway Bridge, which carries the Southern Region line over the river between Charing Cross terminus and Waterloo.

Development of the South Bank had for a long time been a cherished ambition of the London County Council, for the ugly waterfront of derelict wharves and warehouses, badly bombed in the last war, contrasted sharply with the imposing modern buildings ranged above the Embankment Gardens on the north side of

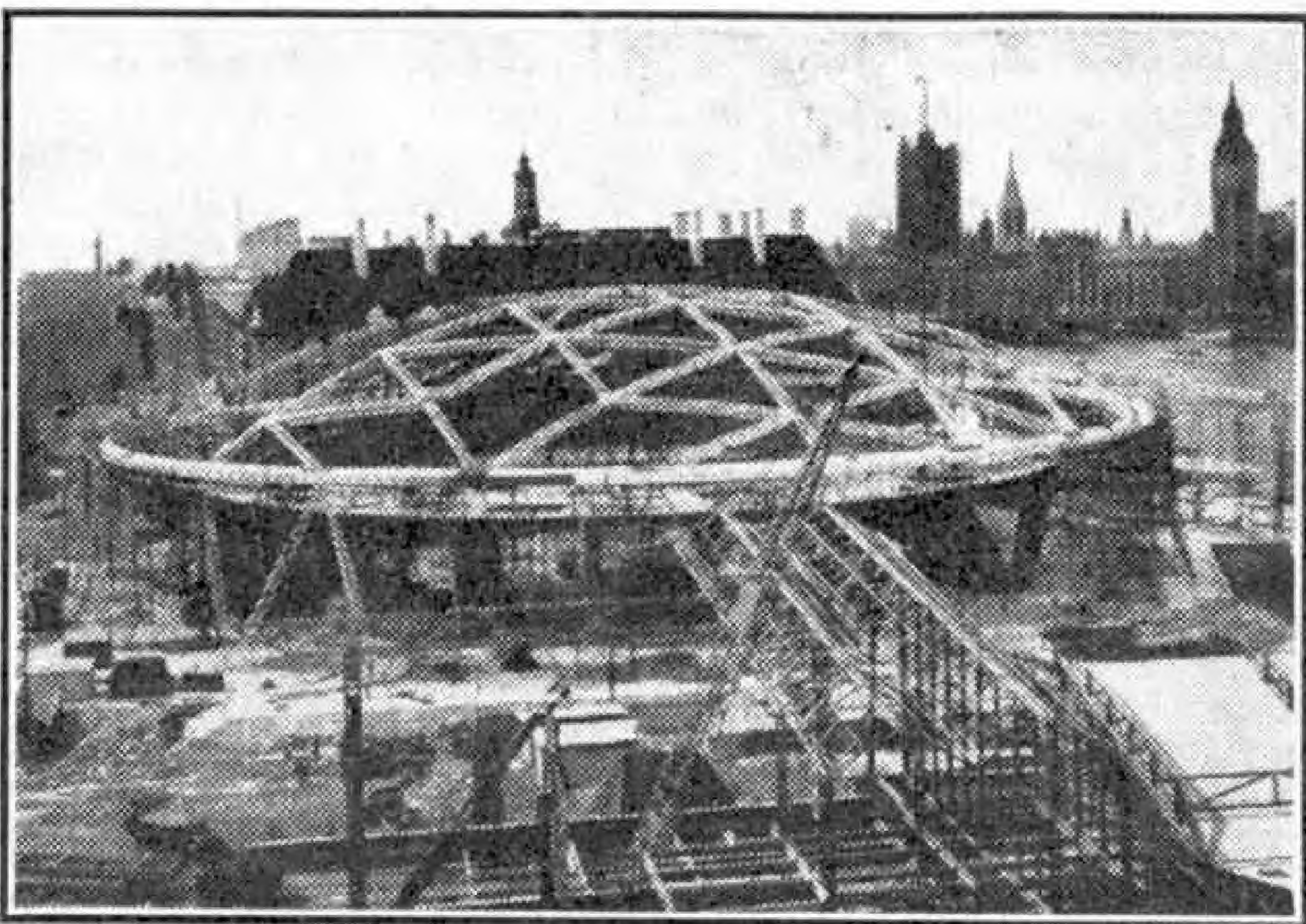
the river. Clearance of the site, which began in 1948, and the building of the new river wall adjacent to it has cost £2 million.

The new river wall and promenade is an essential part of the Exhibition site and will be laid out as a garden walk, with waterfront cafes and restaurants looking out on the pageant of river shipping passing up and down. It extends for about 600 yds. from County Hall to a point just downstream of Waterloo Bridge, and in connection with its construction about $4\frac{1}{2}$ acres have been reclaimed from the river mud. This means that the new wall has been built at distances of from 60 to 140 ft. in advance of the former river frontage. Landing stages and steps provide direct access to the river. Two landing stages built adjacent to the Exhibition grounds will be used by launches and water-buses for

carrying visitors between the South Bank and the Festival Pleasure Gardens in Battersea Park, further upstream.

That the construction of the river wall is the largest civil engineering job undertaken by the L.C.C. since the war may be appreciated from the quantities of materials used. These included 22,000 cu. yds. of concrete, 50,000 cu. ft. of granite and 1,500 tons of steel for use in temporary cofferdams. Construction was carried on in the dry, inside the cofferdams, and to provide working platforms and protect the works in course of building, temporary timber stagings were erected in the river. The timber used was salvaged from emergency Thames bridges erected during the war.

The purpose of this Exhibition is to tell the story of Britain's past and present achievements, and to show some of her actual plans for future development. The story is to be unfolded in panorama form



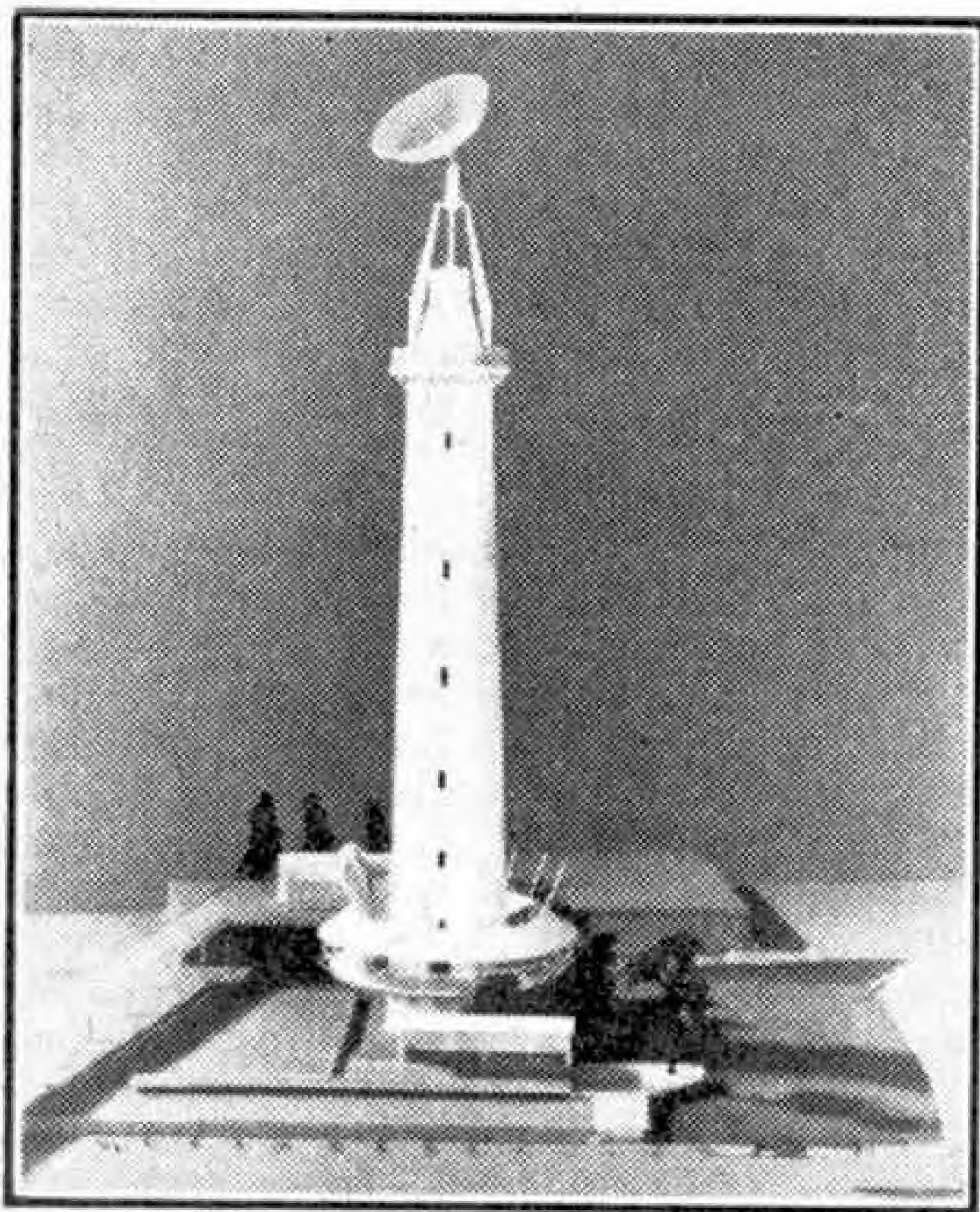
Erecting the Dome of Discovery, with the arch ribs ready to support the aluminium roof. In the foreground the steel frame of the Transport Pavillion can be seen.

by means of selective displays drawn chiefly from the fields of science, technology and industrial design. These displays will be seen in a series of pavilions, each of which is to be devoted to some typical aspect of life in these islands; for example, Discovery and Exploration, Industry, Transport, Rural Life, the Home, the Sea and Sport.

Thus in a tour right round the Exhibition the visitor will find a continuous visual story of the living, working Britain of to-day. Although this is not a trade fair, many of the best designed products of our factories will nevertheless form a very important part of the displays.

Buildings for an exhibition of this size presented something of a problem in these days of material shortages. But the choice of temporary fabric structures, involving the use of many different kinds of materials, has solved that problem in a way that is certain to prove visually exciting and stimulating for all who visit the South Bank between May and October. The first impression will be one of bold architectural contrast in colour and outline, and some of the structures will be of quite thrilling shape and fantastic design such as have not been seen in Britain before.

A typical example of the futuristic patterns which may be seen on the South Bank is what is known as the Vertical Feature, which looks rather like a rocket about to be fired to the Moon. This will act as an enormous "pointer" to the Exhibition, shining in sunlight by day and



A prominent feature of the South Bank Exhibition will be the Shot Tower, a famous old London landmark. The umbrella-shaped aerial of the radio telescope has been erected on it.

illuminated from the inside by night. It will create the illusion of a heavier-than-air structure defying the laws of gravity, with its base suspended in a cradle of steel cables 40 ft. above the ground. The cradle is supported on three aluminium-tube, lattice-style pylons, each 68 ft. high.

The Feature itself is a twelve-sided aluminium frame, 250 ft. high and 14 ft. wide halfway up, tapering in curves to its upper and lower ends. After nightfall it will appear as a blazing pillar of light suspended over the Exhibition and pointing down to it. Tungsten-filament electric lighting is uniformly distributed throughout the length of the object to give an intense light.

The most striking of the Exhibition pavilions is the Dome of Discovery, the largest dome in the world, which is 365 ft. in diameter and 93 ft. to the apex. It will be used to tell the wonderful story of British pre-eminence in discovery and exploration. The saucer-shaped dome consists of built-up ribs, intermediate rafters, purlins and sheeting all made of aluminium alloy. It is supported on a circular ring girder of welded steel, that in turn stands on tubular steel struts 45 ft. above the ground. Inside the dome are three galleries, placed at levels of 35 ft., 22 ft. and 12 ft. respectively and supported on reinforced concrete fins and steel framework. It is on these galleries that the displays will be shown.

The range of subject matter being put on view in the Dome of Discovery is very wide indeed, for it embraces discovery and exploration by land and sea and into the very nature of the universe. Side by side with the achievements of such famous explorers as Cook and Livingstone will be displayed the discoveries of distinguished British scientists like Newton, Darwin, Faraday, Thomson and Rutherford. One section will show the latest knowledge of the structure and nature of matter, culminating in a display of nuclear energy. Others will be concerned with land, sea and Polar exploration, Inner Space, Outer Space and the living world. There will be specially designed models and working demonstrations illustrative of scientific discovery, and also such realistic displays

as, for example, a reconstruction of an Antarctic scene, with the most modern polar equipment and live sledge dogs.

Another interesting feature of the Exhibition is the Shot Tower. This of course is not new at all, but is one of the famous old landmarks of London's riverside. It was built in 1789 to manufacture



Laying aluminium sheeting on the roof of the Dome of Discovery.

shot for sporting guns and was used for that purpose until recently. Molten lead released from the top of the 140 ft. tower cooled and formed the small globules that were finally passed out as shot.

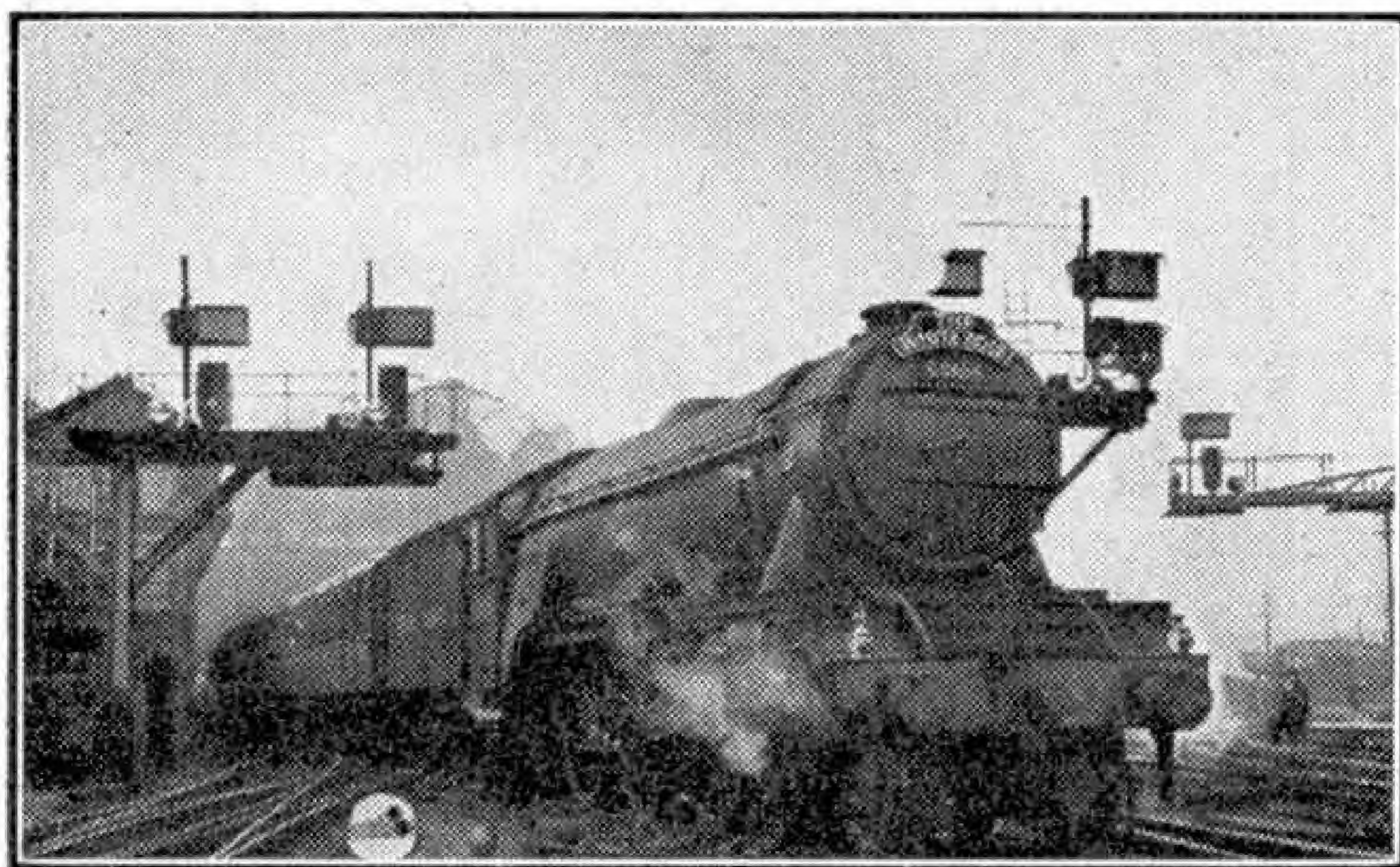
Visitors to the Exhibition will not be able to climb the Shot Tower, but its summit is to be used as a lighthouse and to mount the large aluminium aerial of a radio telescope, the latest scientific aid of astronomers. This umbrella-shaped aerial, 30 ft. in diameter, will be rotated by remote control from the "Outer Space" section of the Dome of Discovery. Visitors to the Dome will thus be able to see, and perhaps hear, radio waves from the Sun and stars, and even from meteors. They may also transmit radio signals to the Moon and, in a matter of two or three seconds, watch their reflection back to earth again. Progress of the radio signals in transit will be watched on a large cathode ray tube similar to those used in television.

Railway enthusiasts are promised a feature of special interest in the shape of a French 2-2-2 Buddicom locomotive, 110 years old and still in perfect working condition. An article on this engine, of British design, appears on page 109 of this issue.

"The White Rose"

OUR cover this month, which is based on a photograph by "M.M." reader H. Weston, of Coventry, shows "*The White Rose*" Leeds and Bradford express of the Eastern Region of British Railways leaving Leeds Central for King's Cross. This is an afternoon departure now leaving Leeds at 3.15 p.m., the corresponding down train being the 9.18 a.m. from King's Cross. In the naming of this service its importance as one of the Yorkshire expresses is recognised; and the name itself refers to the traditional emblem of the broad-acred Shire.

The morning train out of King's Cross



"The White Rose" leaving King's Cross, headed by a Gresley "Pacific,"
British Railways Official Photograph.

runs down to Doncaster without a stop, and then pauses at Wakefield before reaching Leeds at 1.8 p.m. The same stock is used for both outward and return trips, so that an hour or two later it is on the move again, south-bound. The engine does not do duty each way, however, for the up train is taken back from Leeds by the engine that has worked out from London on the 4.0 a.m. This engine has to work hard; eight intermediate stops are made on the up journey, the last of them at Hitchin, before King's Cross is reached at 7.55 p.m.

"*The White Rose*" and the other Yorkshire services of to-day belong to a distinguished line of trains, for the King's Cross and West Riding services have long had a special reputation. At times they have been among the first to benefit from

any improvement in stock or equipment. In 1879 the first dining car in this country was introduced on the Leeds run by the old Great Northern Railway. Then when corridor trains were becoming more widely introduced, the G.N.R. put into service some fine-looking 12-wheeled vehicles with clerestory roofs, Pullman vestibules and centre couplers, and these coaches were included in many of the Leeds trains for a long time.

Another notable coaching development was the introduction of articulated vehicles, which the G.N.R. pioneered many years ago. Articulation involves the use of a single bogie to support the adjacent ends of a pair of coaches, the outer ends of such a twin unit being supported each on its own bogie in the usual way. In 1921 this articulation idea was developed to include all the vehicles of a five-coach dining car set specially built for the Leeds service. In this train an important innovation was the provision for the first time of an all-electric cooking apparatus in the kitchen car, which formed the centre vehicle of the unit. This unique "quin"

set, now in B.R. livery, is in use on "*The White Rose*" at the moment of writing.

At one period it was a Leeds train that made the longest non-stop run on the line, although not quite the fastest. This was the 2 p.m. from Leeds Central, which was distinguished, as were certain other G.N.R. services, by the timetable description "*Special Express*." This particular "*Special*" was booked to run up from Wakefield, 175½ miles, non-stop at an average speed of 57 m.p.h.

Since the railway grouping of 1923 Leeds has been served by various Pullman trains, including the romantically named "*Queen of Scots*." These services soon established a reputation for comfort, punctuality and good running that was only rivalled by the streamlined "*West Riding Limited*" introduced in 1937.

Customs and Excise

By Morris Rodney

IT may surprise many people to learn that in this country indirect taxes yield more money for the Treasury than the income tax that most of us pay. The collection of direct tax is a comparatively simple matter, but the gathering of indirect taxes has many complications. They are fairly equally divided between Customs and Excise duties, so we had better understand the difference for a start. Customs duties are those levied on imported goods only.

Excise duties are payable on certain kinds of manufactures at home, in addition to impositions like purchase tax, betting tax and entertainment tax. Excise revenue also includes the licence fees charged to brewers and distillers, and to tobacco and sweet manufacturers and dealers and retailers in those and several other goods.

Since 1909 both Customs and Excise duties have been collected by a joint staff, although the duties themselves remain quite distinct. With headquarters in London, the Customs and Excise Department divides Britain into some 40 districts, which are known as Collections and are headed by Collectors. These are sub-divided into stations, usually with a single officer in command of each. Most collections handle both Customs and Excise duties, only a few of those inland dealing with Excise work alone. One or two are merely concerned with Customs duties. As these are only imposed on imports, the labour of collecting them is naturally concentrated at the seaports and air terminals.

The normal Customs duties yield well over £750,000,000 a year and protective duties a further £50,000,000. Excise duties provide over £660,000,000. With so much money involved in collecting these duties great vigilance is needed to account for every penny. Despite large increases in recent years, these duties are

gathered by a staff actually smaller than it was before the war. This numbers just over 14,000 of all grades, and covers every aspect of the work from the initial collection to the final accounts rendered to the Treasury. It can be broadly divided into two groups, those who attend to the routine collection work, and a special staff employed solely against smugglers.

Customs duties are so high on some goods that many people, ranging from



Baggage is inspected with a watchful eye on the traveller, whose outward calm may be a pose to allay suspicion. The illustrations to this article are reproduced by courtesy of the Central Office of Information.

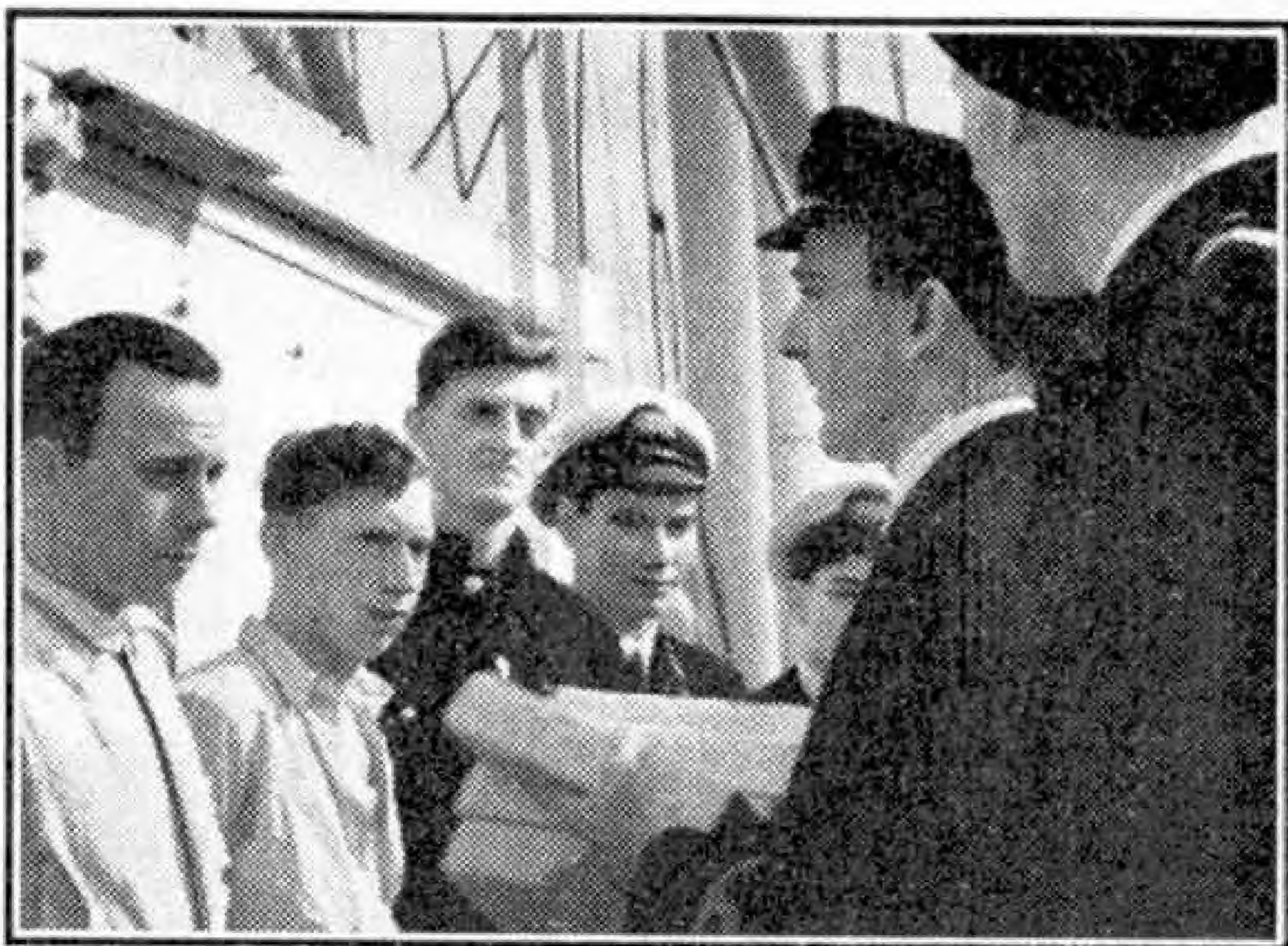
bungling amateurs to skilful racketeers, try to avoid paying them. It is the job of the Preventive Staff, still known by their old name of Waterguard, to see that their efforts are unsuccessful.

The Waterguard is a force of about 2,000 uniformed officers, controlled by an Inspector General. Based on the seaports, it not only keeps an eye on all ships arriving from abroad, but also maintains a patrol along the coastline with its own fleet of cruisers, hovering on the lookout for smuggling vessels. Boarding launches meet the ships as they enter port and put a small group of officers on board to seal up all dutiable stores and search for contraband. It is no easy task to ransack a ship, even by men trained in the work; and if it is suspected of having smuggled goods hidden away the "rummage crew"

has to be strengthened. Its members are encouraged by the fact that rewards are paid for any hauls they make. Other officers go over the baggage brought ashore by passengers, and sometimes the passengers themselves if they are trying to smuggle goods on their person.

Heavy penalties are imposed for smuggling, the maximum being a fine equal to three times the value of the goods, including the duty payable on them, with a prison sentence of up to two years in addition. As if this were not enough, the goods are seized into the bargain. More than 30,000 seizures a year are now being made, the goods being later sold for the benefit of the Treasury. Nowadays, with currency restrictions, the Preventive Staff has to keep a watch on people trying to smuggle valuables out of the country. Inland, there are often attempts to avoid Excise duty by brewing home-made beer or distilling spirits. Other dodgers are busy trying to get round the Purchase Tax regulations, or to avoid paying their full share of Entertainment Tax. All of these must be detected as soon as possible and stopped.

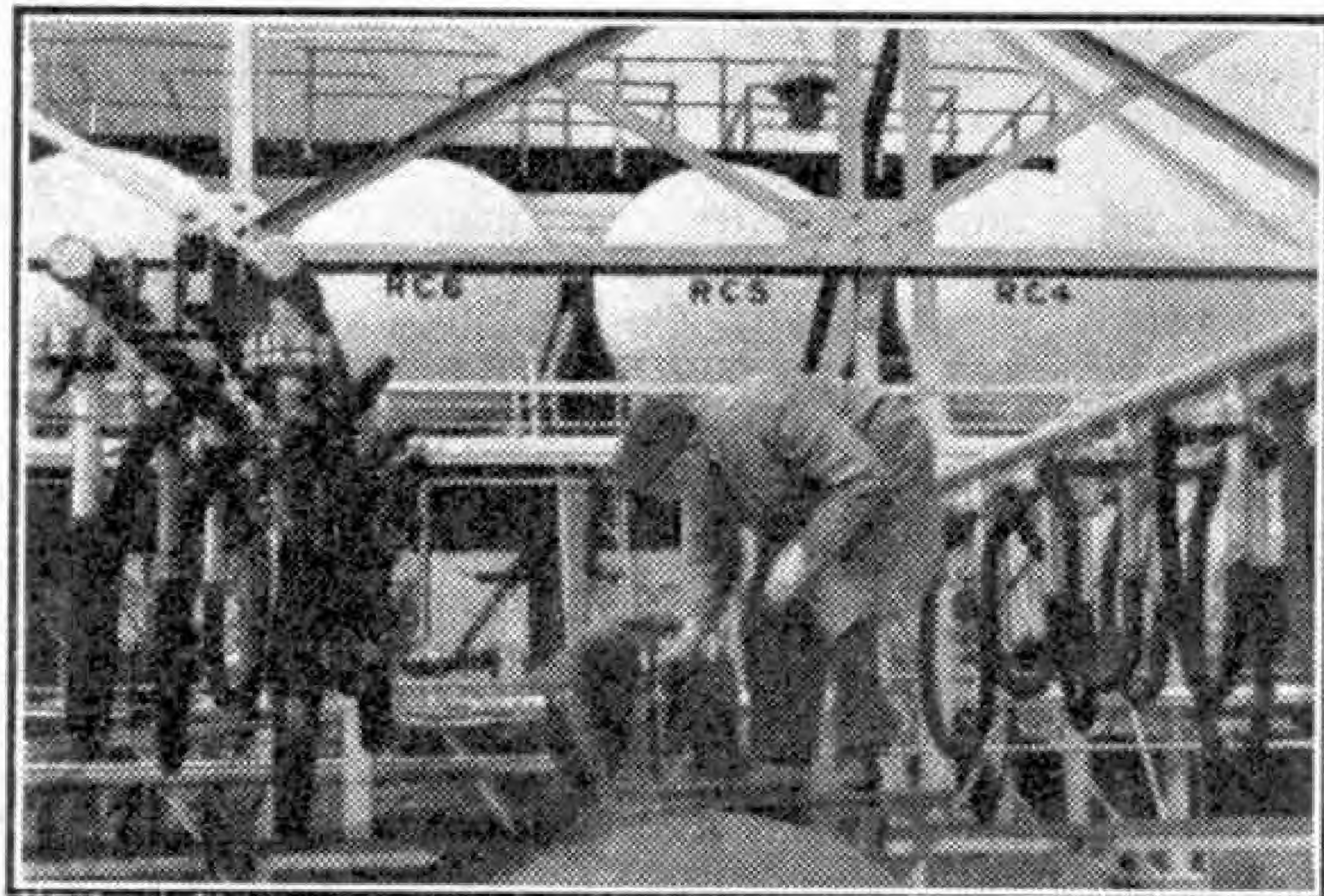
Unless the Customs and Excise Department had facilities for assisting traders, national commerce would be seriously handicapped. Many importers cannot afford to pay heavy duties in a lump sum, while some goods, although liable to duty, are only imported temporarily before



The Waterguard officer has discovered hidden contraband and questions the crew to find the culprit.

being sent to another country abroad. For such cases there are Bonded Warehouses, in which the goods can be deposited without payment of duty. This only becomes payable as the goods are transferred from the store to the owner's premises. No duty is levied if the goods are exported straight from storage. Since goods worth about £3,000,000,000 in duty are normally stored in Bonded Warehouses one can appreciate the value of this facility to merchants.

The Department also proves that a Drawback can actually be a help instead of a hindrance. This particular Drawback is a refund of duty paid when goods which have been imported are later exported in the form of manufactures. The idea behind this and other facilities is to keep the wheels of trade running as smoothly as possible. It involves a great deal of work bringing no financial return, but is all part of the service provided in return for an outlay of less than £10,000,000 a year, which works out at roughly 12 shillings for every £100 collected in various kinds of duty. With a Department fully prepared to gather money from thousands of different sources, from members of the "Old Firm" bawling the odds on a racecourse to singers of grand opera, one would expect versatility. With this in mind, other branches of the Government take good care to make use of it.



Oil in a Bonded Warehouse, awaiting the payment of duty which brings its release, is checked at regular intervals.

The Customs and Excise Department tackles many duties which are quite outside its normal scope. These cover a wide range and include the recruitment of naval volunteers and the payment of pensions on behalf of the Admiralty, checking the importation of certain plants and pests for the Ministry of Agriculture, and watching for the illegal shipment of arms, ammunition and drugs, in which the Home Office is concerned. The Board of Trade relies entirely on the Department for those important tables showing the balance of national trade, these being made up of

remains. A ship breaking up off the coast often results in valuable cargo washing ashore. The Receiver of Wreck in each area must see that none of it is stolen. Unclaimed wreckage, after being advertised by notice in the local Custom House, is finally sold for the benefit of the Treasury.

Another important sideline of the Department deals with the engagement and discharge of crews. Normally the Ministry of Transport has a Mercantile Marine Office in each seaport to supervise this work, together with the payment of wages, or allotment to dependents. But

the smaller ports are covered, on behalf of the Ministry, by officers of the Customs and Excise in the capacity of Superintendents of Mercantile Marine, additional to their normal work. They also act as Registrars of Shipping at every seaport, for this particular work has long been regarded as a Customs province.

It should be explained that every British ship must be registered at a port, although the owner is quite free to choose any port he likes. Most ships are registered at the port where the owners have their headquarters, and full details must be supplied to the Registrar of Shipping

there before he will issue the certificate without which a ship cannot go to sea. The details describe each ship, with particulars of building and ownership; and any changes made later, such as alterations, change of owners, or disposal for breaking up, must be notified to the Registrar and the facts entered in his books. Copies of entries in the registers are sent to the Registrar-General of Shipping and Seamen, the nautical equivalent of Somerset House, from which he compiles the Mercantile Navy List, an annual publication giving details of all ships registered under the British flag. The name of the port of registry must be painted on the stern of each vessel.

Finally, among other odd jobs, the Customs and Excise Department supply policemen for the Admiralty Court or other courts dealing with shipping matters. In this capacity its officers have to arrest ships where debts are involved. This is done by fixing a warrant to the mast.



A member of the Landing staff, who do not wear uniform, gauges a cask of wine to assess the duty.

Customs declarations and eventually published as monthly and annual returns. The Board of Trade operates a number of controls on the import and export of goods, and once again looks to the Department to see that such goods are not on board ships, or to take suitable action if they are discovered.

Some of the most interesting work is done for the benefit of the Ministry of Transport. Customs and Excise officers present captains of all ships, British and foreign, with Light Bills, the sums they have to contribute towards the maintenance of lighthouses, lightships, buoys and other marks and warnings on and off the coast of Britain. They also act as Receivers of Wreck, a job which merits a word of explanation. In early times wrecked ships were often looted, while survivors even ran the risk of being finished off for the sake of their possessions. Wreckers of ships, employing false lights, have long disappeared, but human greed

Rocket to the Moon

By John W. R. Taylor

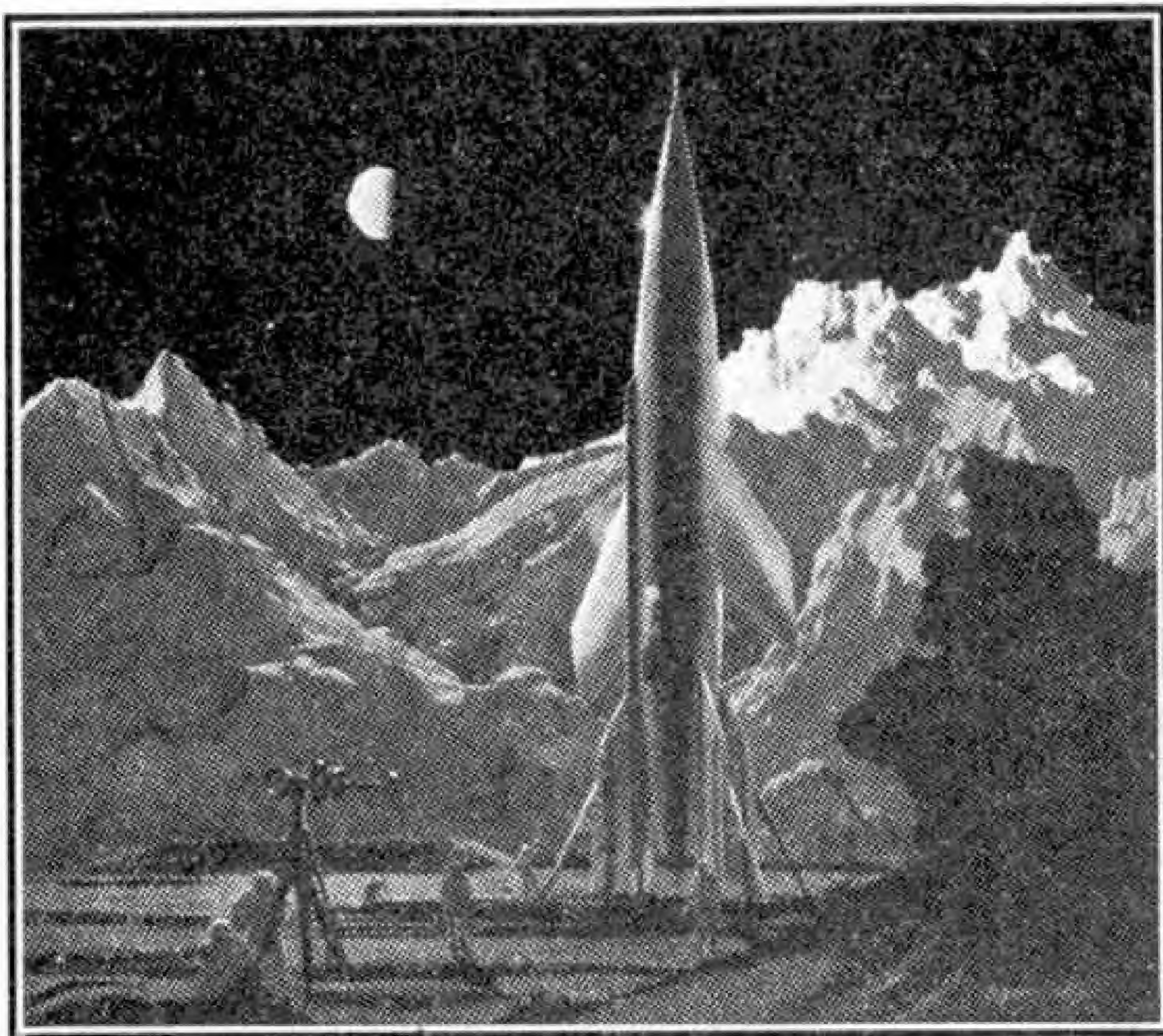
FOR hundreds of years men have dreamed of flying to the Moon. Scores of books have been written on the subject, most of them fantastic and entirely lacking in scientific fact. But they represented the sum total of constructive thought on interplanetary flight until, in the years between the two World Wars, small groups of scientists and enthusiastic would-be space-flyers began to tackle its problems on scientific, practical lines.

We experienced one unpleasant result of their research in 1944-45 in the form of the German V.2 war rocket, which, in one jump, lifted space-flight out of the Buck Rogers comics and made it seem merely a matter of time before we should indeed fly to the Moon. Of course V.2 was a comparatively short-range rocket, but it can be compared in significance with the Wright biplane of 1903. It was the prototype that proved the practicability of controlled rocket flight, just as the Wright biplane had proved the practicability of powered aeroplane flight.

Development of the rocket has been slow since the war, but plenty of capable, clear-thinking people believe that before the next 40 years have passed the Man-in-the-Moon will no longer be a figment of the imagination.

The theory of the whole business of space-flight has already been solved, checked and double-checked. All we need to make interplanetary flight a fact is an engine or fuel of tremendous power to drive a manned rocket out of our atmosphere into space. Atomic energy may well supply the answer to this, to bring the Moon within four days of the Earth, and make Mars, Venus and the other planets our near neighbours.

But the problem of getting there is only the start of our troubles; just as difficult will be to find means of surviving once we have arrived. Apart from its lack of oxygen, the Moon presents few hazards, and we could probably exist for a while on Mars if suitably equipped with heated



On the Moon. The rocket ship, having landed on its tail, will take off from this position for the return to Earth. This illustration is from the book "The Conquest of Space" referred to on this page, and is reproduced by courtesy of Sidgwick and Jackson Ltd.

pressure-suits and oxygen equipment. The same is by no means true of the other planets. Take Jupiter for instance, whose surface is believed to consist of mountains of ice, rising from lakes of liquid ammonia. Hydrogen flames and "lava" pour from the tops of the mountains, under an atmosphere of methane and ammonia gas, causing "hydrogen bomb" explosions over the whole surface of the planet. Hardly the place for a picnic, and certainly not the home of "Flying Saucers"!

It will probably be many years before we start reading in "Air News" of the latest adventures of "astronauts" in their Moon-rockets. But we can get a good idea of what they will see when they get there from a new book called "Conquest of Space" (Sidgwick and Jackson, 18/-), just published in this country. It contains remarkable paintings, by a young American named Chesley Bonestell, of landscapes on the other planets of our solar system, and of the Earth and planets as they would appear from a space-ship and from other "worlds." The accompanying text by rocket expert Willy Ley describes in a simple, very readable manner how we may one day fly to the planets and what we shall find there.

"Conquest of Space" is based on the latest scientific research and cannot fail to fascinate even the most sceptical reader, for it presents a preview of the greatest adventure still awaiting mankind.

The River Craft of China

By Bernard Llewellyn

MY first impression of China's greatest river, the Yangtse, was of its power. It was on a wet afternoon that I got my first sight of it—a mighty river in the grip of a tremendous current. Its waters were approaching their height and were silvered by sullen shafts of fitful sunlight.

This was in Szechwan Province near the city of Luhsien, where the Yangtse was 2,000 miles away from its mouth and yet was nearly three times as wide as the Thames at London Bridge. The middle of the river was a deep oily green, swirling relentlessly seaward and carrying every drifting thing with it. There were constant eddies and whirlpools, as if the river god were stirring in his hunger, impatient for the next tiny sampan to overturn.

The usual means of crossing the Yangtse at Luhsien was by steam ferry, but one night I missed the last ferry and crossed to the northern bank by sampan long after dark. It was a memorable crossing and now, looking backward, it seems a romantic one.

The sampan had a crew of two, a man and a boy. There was a mat awning amidships and room for half a dozen passengers beneath it. An oil flame hung from the roof, and beneath it I sat to watch the rhythmic movement of the steerman's feet on the deck as he plied the long steering oar astern. In the bow another oar, which the boy pushed in short jabs away from his body, coaxed the boat out into the dark river.

Near the banks the boat was under obvious control, but as soon as the sampan touched the edge of the current the shore and the rows of sampans along its edge spun away, and we were whirled downstream. Yet somehow or other the rowers

kept the boat at an angle to the current and moved it ever so slowly towards the north bank. Two miles or so down river we reached the landing stage on the other side.

To the inhabitants of Central China, the Yangtse is just the "Great River," China's main artery, more than 3,400 miles long, stretching from Tibet to Shanghai. All kinds of craft are found along its waters, from ocean-going steamers,

which can get up river as far as Hankow, to smaller steamers that penetrate many miles farther, and the junks, which journey all the way from the sea to the inland frontiers of China and Tibet.

I suppose we think of the junk as the most typical of all Chinese river craft. People who have never seen the real thing have no difficulty in picturing it with its great lugsail aloft, adding beauty to the loveliest of landscapes.

A popular Chinese name for the junk is "camel of the river." It may carry

a bigger load than a whole train of camels—some modern junks can carry up to 90 tons of cargo—but it has the same unhurried perseverance as "the ship of the desert," and covers great distances where no other means of transport is practicable.

Junks vary greatly in size and type. An expert on such vessels will distinguish hundreds, and assign each type to the rivers or lakes where it is most commonly found. But they are all shallow in draught and can traverse rapids in rivers that the steamer cannot enter, although even to them some stretches of river remain extremely dangerous.

Between the cities of Chungking and Ichang are the notorious Yangtse Gorges, with names like Wind Box and Ox Liver.



A junk, the Chinese "camel of the river," with sail aloft on the broad waters of the Yangtse.

They have high unscalable cliffs rising sheer from the river. In 375 miles of water there are 50 dangerous rapids on which hundreds of junks have perished.

One of the worst periods for junk casualties was during the early phases of

will be of little help, and then he must either hire a steam launch to tow him or use "trackers."

You will find trackers on all Chinese rivers. Theirs is sweated labour with a vengeance! Slings round their chests are fastened to the thick heavy tow-rope, and they trudge along the water's edge, their brown naked backs glistening with sweat. Sometimes they chant a chorus as they pull at the rope. I have seen 30 or so men heaving at the ropes, and for all their efforts scarcely able to move a junk against the power of the river.

The junk has probably not altered shape much since the days when it was, according to legend, designed by the "engineer" Lu Pan in

the first century B.C. By the more superstitious of Chinese junk men the sister of this gentlemen is believed to inhabit the port side of every vessel's cabin.

It is perhaps not surprising that superstitions should flourish among the people who live on China's rivers. Dragons are still seen in the swirl of a whirlpool, and shrines are built on the banks of rivers to ensure the protection of the gods. Some junks have huge eyes painted on their bows to look out for underwater perils. Again, evil spirits sometimes pursue junks, and to dislodge them a junk steersman will not hesitate to swerve across the bows of an approaching steamer.

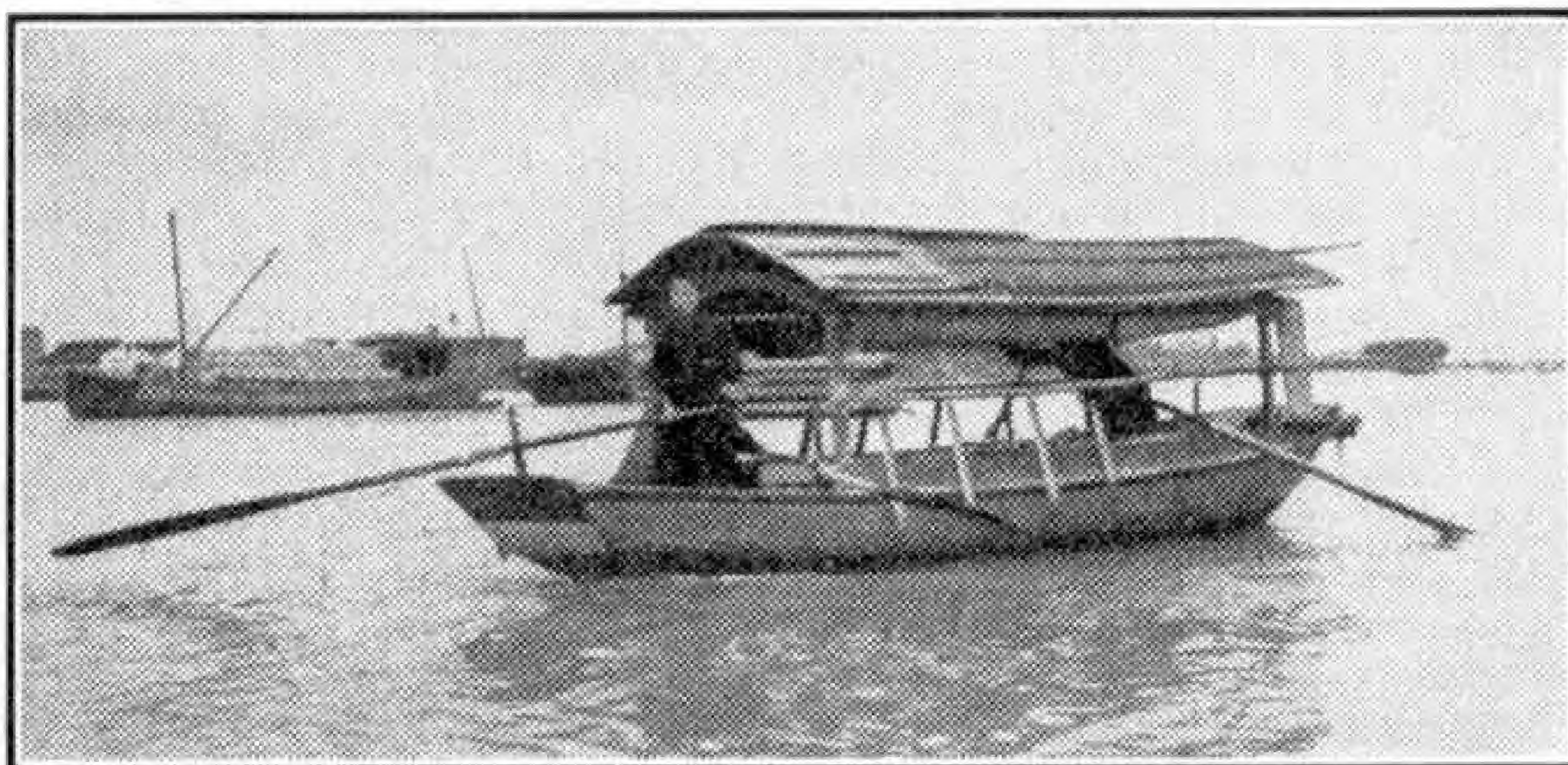


There are always boats to watch in busy Shanghai's Soochow Creek.

the Sino-Japanese war. In 1938 the Japanese were attacking the great city of Hankow, sometimes called the Chicago of China, where the large steamers have to turn back to the sea, and the Chinese began to evacuate themselves and as much of their goods as could be moved. The camels of the river were indispensable. In two weeks junks moved 400,000 tons of goods and equipment up the rapids from the besieged city.

It was a perilous adventure. As if the natural dangers of rock and current were not enough, the junks had also to endure attacks from Japanese dive bombers. The vessels that finally reached safe anchorage among the hills of West China showed that life on a junk is not always the peaceful affair that some people imagine.

At Batang in Sikang Province the bed of the Yangtse is nearly 10,000 ft. above sea-level, which gives some idea of the difficulties confronting a junk owner travelling up river and against the current. Often his sail



A sampan on Pearl River, Canton, looking for a prospective passenger.

Rapids are not the only dangers that junk travellers have to guard against!

On the Pearl River in South China a type of junk often popularly referred to as a Noah's Ark is common. These vessels have sweeping hulls and enormous sterns that might have belonged to the Spanish galleons that Drake once chased in the Caribbean. They carry passengers and are towed behind little steam launches.



Off the Canton waterfront ply sampans and junks without number.

One July, aboard one of these Noah's Arks, I travelled from Canton to Wuchow, in Kwangsi Province. I was on the ark for three days, sitting, eating, and sleeping on a rush mat covering the hard wooden boards of my bunk. Mine was one of four junks on tow, and the thick fibre ropes that joined us together sagged in the water.

Twice during the trip I saw ropes snap, and the launch with its remaining vessels in tow made a slow turn in the river, and came alongside the boat, which had been left at the mercy of the current, so that a new line could be thrown aboard.

Over 300 years ago, Captain Weddell, the first Britisher to visit Canton, remarked on the forest of sampans and fishing boats along the Canton waterfront. To-day it is just the same. Possibly more small boats are to be found in and about Canton than along any other short stretch of water in the world. They are the homes of a river people, the Tanchia, who have lived on the river as far back as the memory of man and jealously preserve their own customs and ways of life.

Nearly every time I had occasion to use one of these Pearl River sampans it

was rowed by a mother and daughter. The women manipulate these craft through the Canton backwaters with the skill of a Venetian gondolier. Girls of six or seven can handle an oar almost as deftly as an adult.

While junks and sampans of one kind or another can be found wherever there is navigable water in China, rafts are not so common. In Szechwan and elsewhere

you can see small fishing rafts with cormorants aboard, waiting to be flicked off in search of fish by the tip of their master's pole. Each bird wears a ring round its neck to prevent it from swallowing the catch.

I think the rafts that go up and down the Ya River from Sikang into Szechwan are unique. The four days I spent on one were among the most exciting of my life. The Ya is too dangerous a river for any craft drawing more than a few inches of water.

In the summer, after the rains, the current is strong and savage, and there are jagged rocks hidden just beneath the surface.

The raft on which I travelled was 90 ft. long and 40 ft. wide, and was made of lengths of bamboo 6 in. in diameter. The prow was curved upward to keep the raft from flooding in rapid water. There were two steering oars, one jutting out from the prow, the other astern, and two additional oars were set in starboard rowlocks. Amidships were a couple of mat shelters, and forward of those were the iron pot and fire where unappetising meals were cooked.

The raft bucked like a mustang over the wilder rapids, and all six members of the crew were kept busy fending her off the rocks. When passing between towering tree-studded cliffs that almost shut out the sky, she seemed at times like a toy. Only consummate craftsmanship kept her in one piece. In the rapids she could only be desperately steered; there was never a chance of stopping her when the river was breaking in waves over her and making her writhe like a frightened living

(Continued on page 142)

A Historic Locomotive Type

A NOTABLE locomotive exhibit in the Transport Display of the Festival of Britain South Bank Exhibition will be a little old French engine of a type always known on the Continent as the "Buddicom" and in Great Britain as the "Crewe" or "Allan" engine. How the type originated is an interesting story.

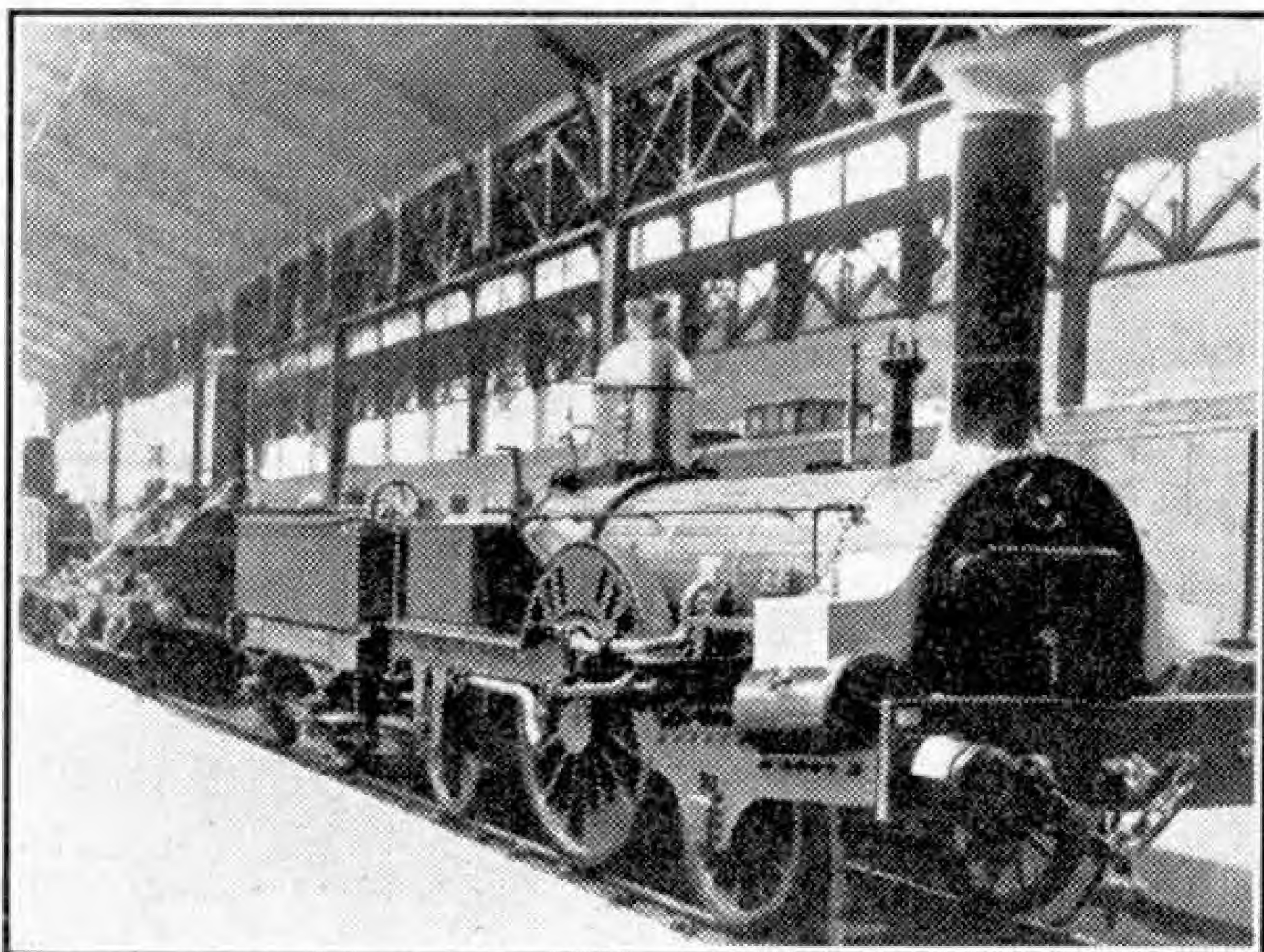
William Barber Buddicom, whose name was given to this type of engine on the Continent, was Locomotive Superintendent of the Grand Junction Railway, a line opened in 1837 between Birmingham and the Liverpool and Manchester Railway, which later it incorporated. The works of the Grand Junction were at Edge Hill, Liverpool, near where the Meccano Works now are, and it was there that the foundations of the design were laid down.

Under Buddicom on the Grand Junction was Alexander Allan, "Foreman of Locomotives," who in the rebuilding of some existing engines included the principal features that were to become typical of the locomotive type that was associated with his name in this country. In the "Allan" type outside cylinders were, rather unusually, combined with double frames of characteristic outline. The bearings to the driving wheels were accommodated in the inside frames, but the carrying wheels had outside bearings. The arrangement at the front end was such that the slide bars and crossheads were between the two sets of frames. Access to the crossheads, little ends, piston rods and glands was provided for by means of a long opening, round-ended at the rear, in the outer frame. The boiler was low pitched and the smoke-box plates were brought out to meet the cylinders, an arrangement also found on various other outside-cylinder designs. These features are evident in our illustration of the Buddicom 2-2-2.

Crewe Works supplanted Edge Hill as the Grand Junction works in 1843, and as Allan was then "Foreman of the

Locomotives" the engines built there to his designs became known as the "Crewe" or "Allan" type. In the meantime Buddicom had left the Grand Junction Railway and gone to France, where Joseph Locke, previously Chief Engineer to the Grand Junction, was then constructing the Paris and Rouen line. Locke was familiar with the characteristics of the rebuilt engines already mentioned, and on a visit to Crewe he saw in preparation Allan's new design on similar lines for 2-2-2 passenger engines and 2-4-0s for goods traffic. Permission was given for similar features to be incorporated in engines for the Paris and Rouen line.

Buddicom was asked to build these engines, and construction was carried out by the firm that he had founded, Allcard,



The "Buddicom" locomotive, a representative of a famous type that will be on view in the Transport Display, South Bank Exhibition. British Official Photograph, by courtesy of S.N.C.F. (French Railways).

Buddicom et Cie at Chartreux, near Rouen, and it was there that the engine to be shown at South Bank was built. Although the design has always been known as the Allan or Crewe Type in this country, it is a fact that the first Buddicom engines appeared before the first of the Crewe engines. This was the 2-2-2 "*Columbine*," now in York Railway Museum.

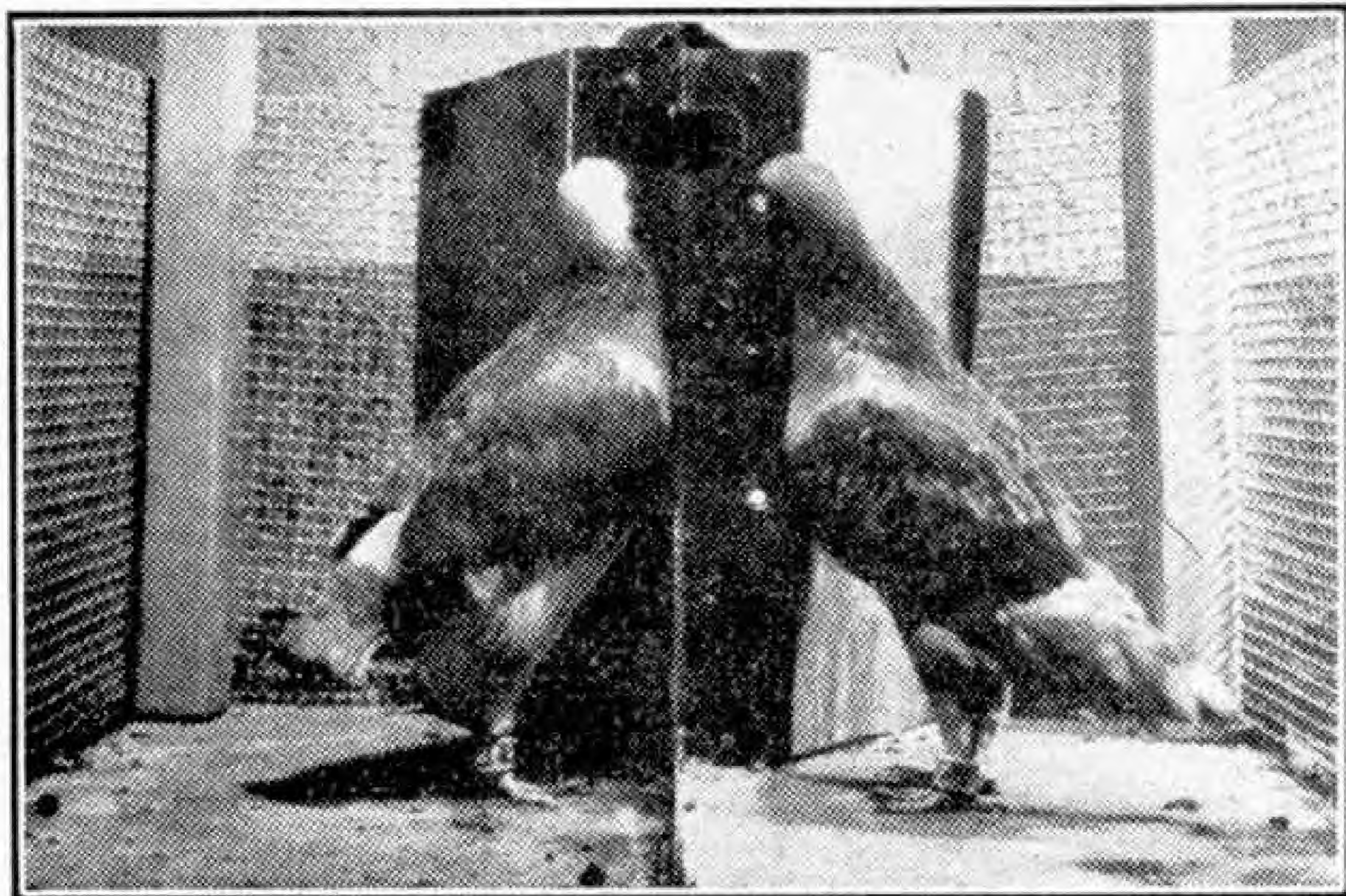
The Paris and Rouen Railway later became the Western of France, and Buddicom engines were standard on it and elsewhere for many years.

Pigeons Working for a Living

By M. Lorant

SEVERAL dozen pigeons are helping scientists in their search for new light on why and how people behave as they

pigeon pecked away over 35,000 times in a five-hour period for a reward of a third of an ounce of food.



A study in co-operation. On pecking together the top buttons of two sets of three, these pigeons are rewarded by the release of a small quantity of food.

do. These birds are used by Dr. B. F. Skinner, Professor of Psychology at Harvard University, in the United States, in a series of experiments to find the role of reward or punishment in getting organisms to perform tasks. For example, Dr. Skinner wants ultimately to know whether a child can be trained more effectively by encouraging good behaviour or punishing bad actions. He now holds the theory that reward is more effective than punishment.

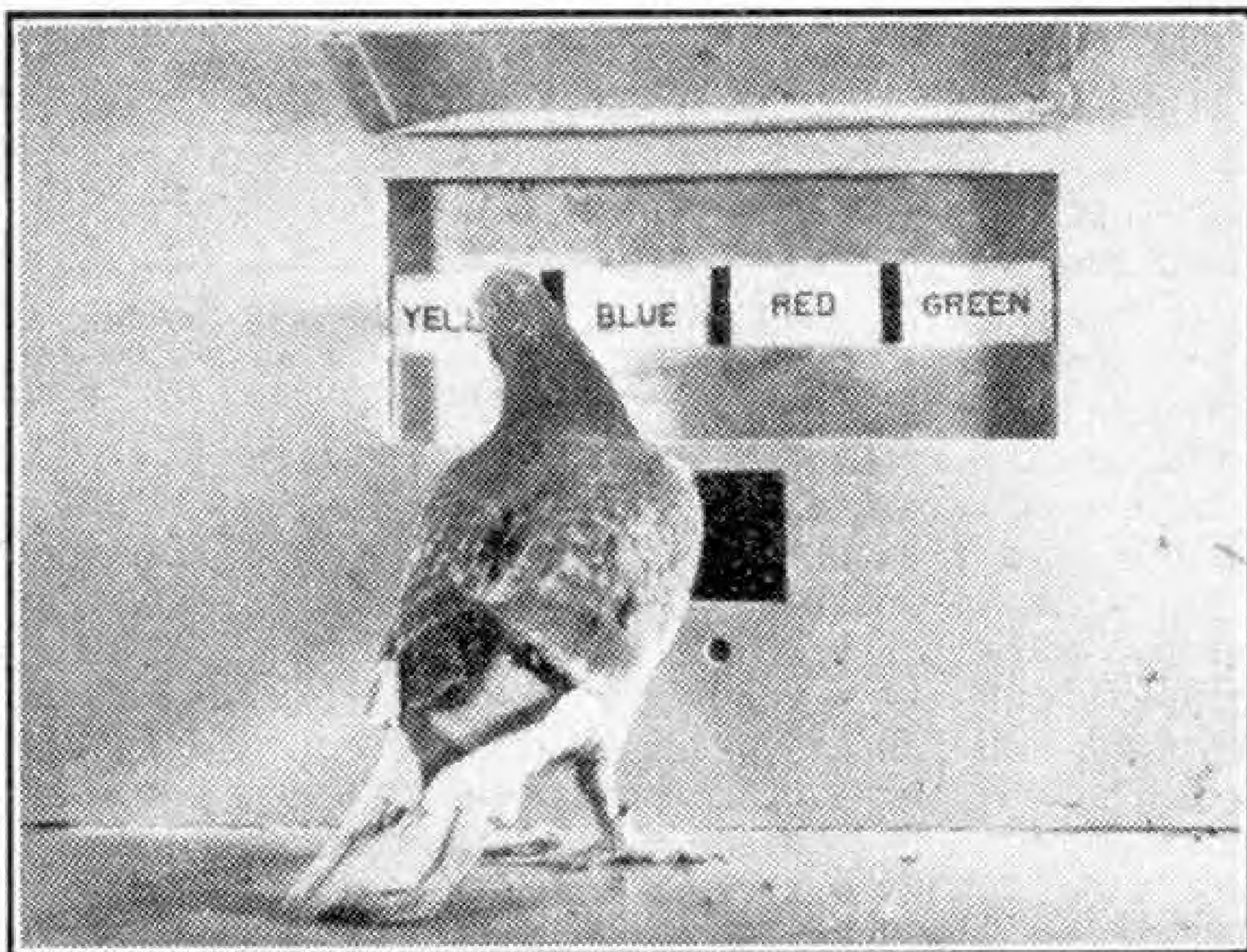
Pigeons have been found ideal subjects for these experiments. They live longer than many other laboratory animals and are less susceptible to disease; their reaction time is comparable to that of human beings, and they have good colour vision. Basically, all of the experiments involve getting a pigeon to go through some action to receive a reward, which in each case is a chance to peck at a bit of food for a couple of seconds. One of them required a pigeon to do a certain amount of work to get food, and one

the food chute opens. Only one pair of food-producing buttons will work each time, but the two birds have little difficulty in exploring the pairs together and selecting the correct pair.

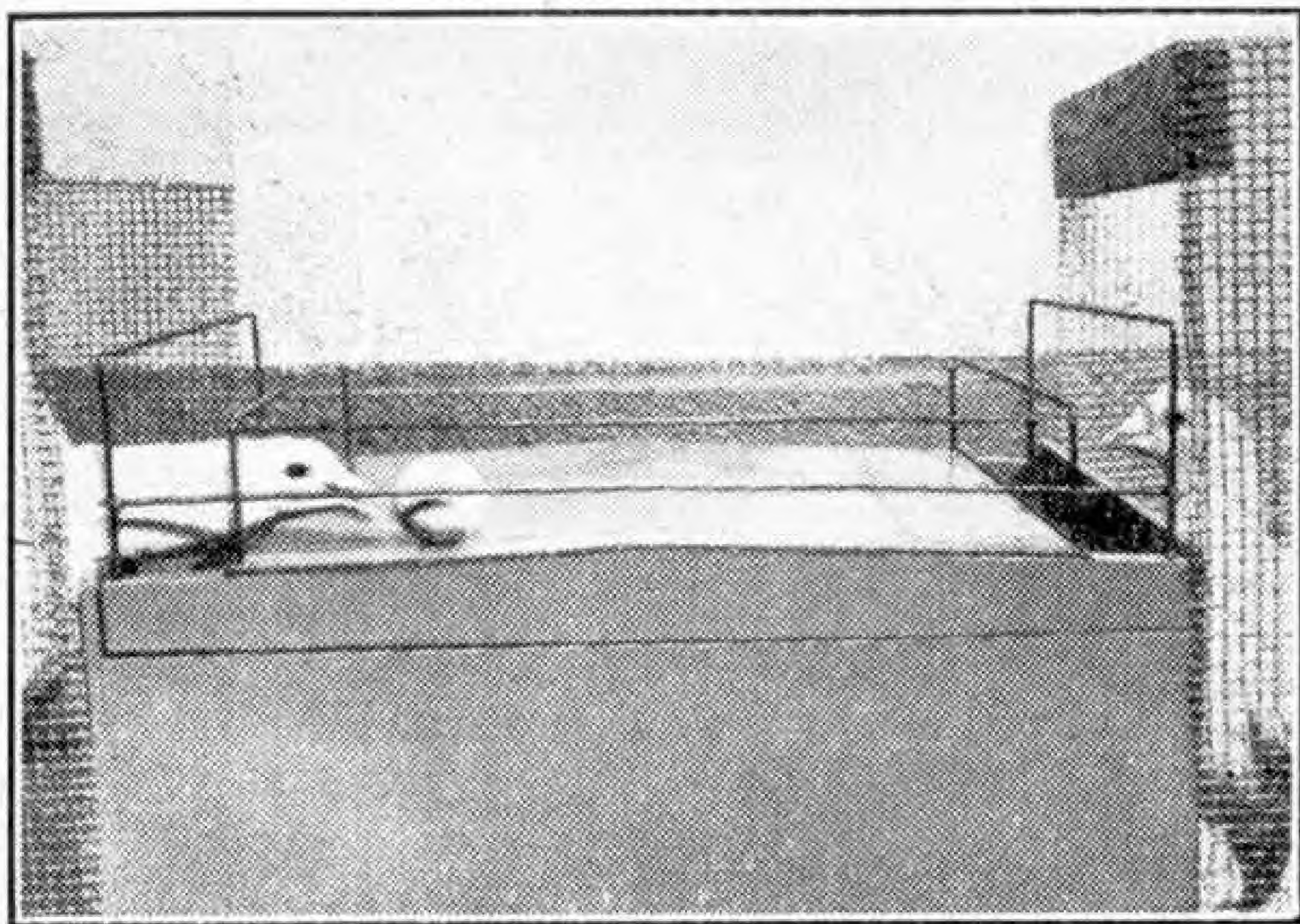
A small brown and yellow pigeon in another demonstration shows that pigeons

One demonstration shows that pigeons can be taught to co-operate with each other to get food. The apparatus for this experiment is a box that is separated into compartments by a glass partition down the middle. A pigeon is placed on each side of the glass. At the rear of the box there is a panel with three pairs of buttons in a vertical row, one row on each side of the glass partition.

To receive food both pigeons must strike simultaneously the matching buttons in the separated cages. When this is done, a light flashes, a buzzer sounds and the door to



Choice of the right colour is rewarded by a feed, and the birds soon learn to peck the correct mark. The colour they must choose is that of a light shone on them.



Pigeons play ping-pong, each trying to get the ball past the other.

can distinguish colours and also can act in different ways in response to different colours. The apparatus for this experiment is a semi-circular cage with bulbs in a box at the top which throw a green, blue, red or yellow light on to the bird, which faces four small squares on which are printed the words "YELLOW," "GREEN," "BLUE" and "RED." When a red light is switched on in the box the bird will peck at the sign that reads "RED." The food door at the bottom of the panel then opens, and it is rewarded with a bit of grain. Then another light automatically comes on. If it is the blue, the "BLUE" sign receives a peck. Properly trained birds are able to peck at the correct sign as fast as the apparatus will permit.

Pigeons also can be trained to do more complicated tasks. One advanced lesson is playing a tune on a piano of seven keys. By rewarding pigeons when they strike the keys in a certain sequence, Dr. Skinner and his assistants have taught them to play simple tunes.

In one of the exhibits, which demonstrates competition, the birds play a modified game of ping-pong. The court is about two feet square, and has no net. Each pigeon, using his beak, tries to tap the ball past his opponent. Rallies sometimes go to three or four shots, but most

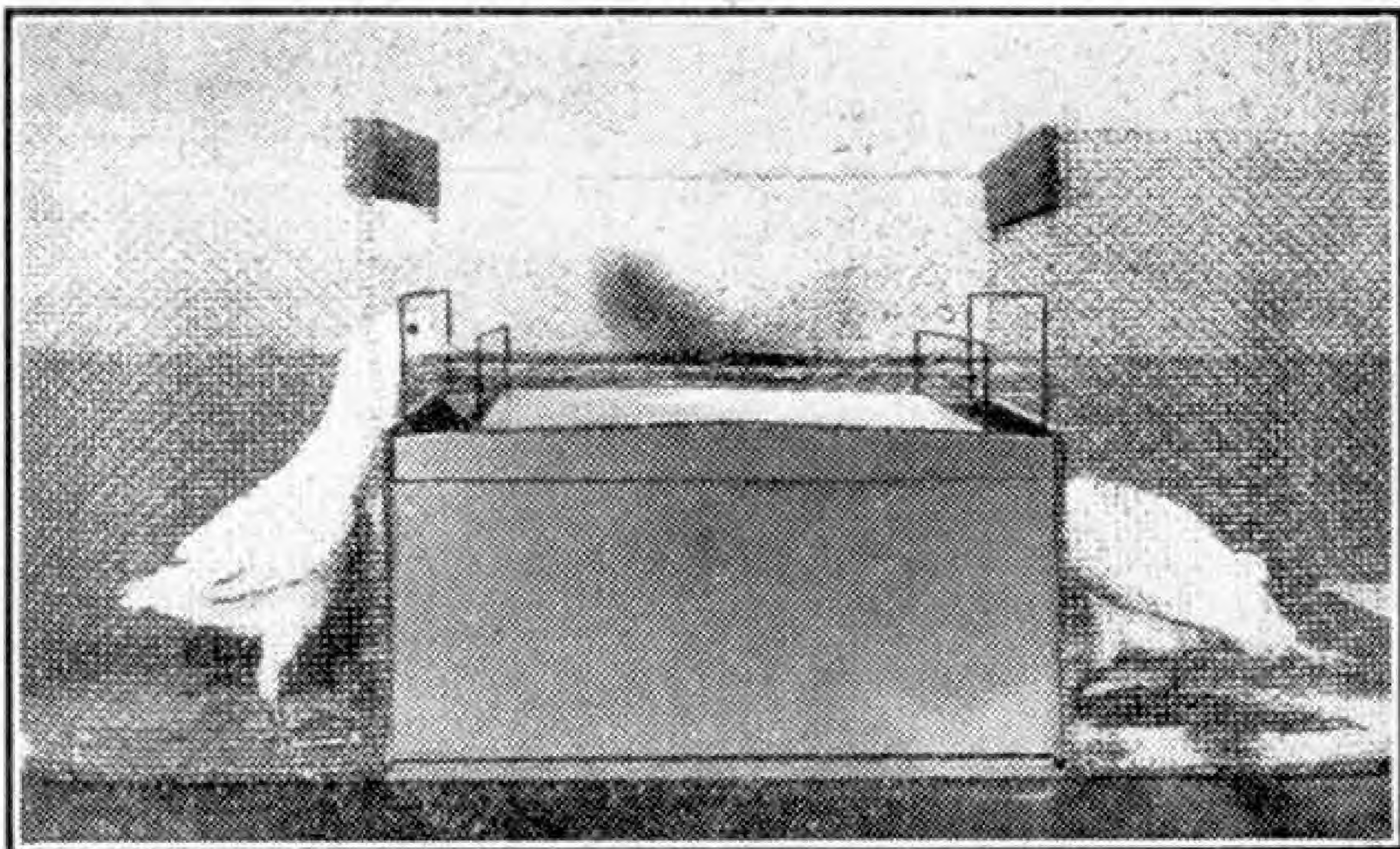
of the shots are "aces." The winner is rewarded with food after each shot.

Pigeons in some experiments develop an ability to "tell time." If an apparatus will "pay off" only 10 seconds after a signal, the pigeons learn to wait. They may turn around once or twice, hop from one foot to another, or peck at other parts of the box in order to kill time for the 10 seconds.

Also, like human beings, pigeons are superstitious. They will tend to repeat any action that they may have happened to be doing when food arrived in the past. Some may build up a complicated rigmarole of

movements just as a card player may walk around his chair for luck. The pigeon will continue to go through his routine even though this has no effect on the delivery of food.

Although Professor Skinner usually works with homing pigeons, he has found that park pigeons or the Harvard Yard variety are just as good subjects. One of his best birds was a pigeon he captured on a window ledge outside his laboratory. Put to "school," the pigeon was soon



The "player" on the left has missed the ball, and the victor is now collecting his reward of feed released by the fall of the ball in the left-hand trough.

playing tunes and batting the ping-pong ball as well as any of the other birds.

The tricks described in this article are only by-products of the Professor's work. His main purpose is to find new methods of studying human behaviour in various situations.

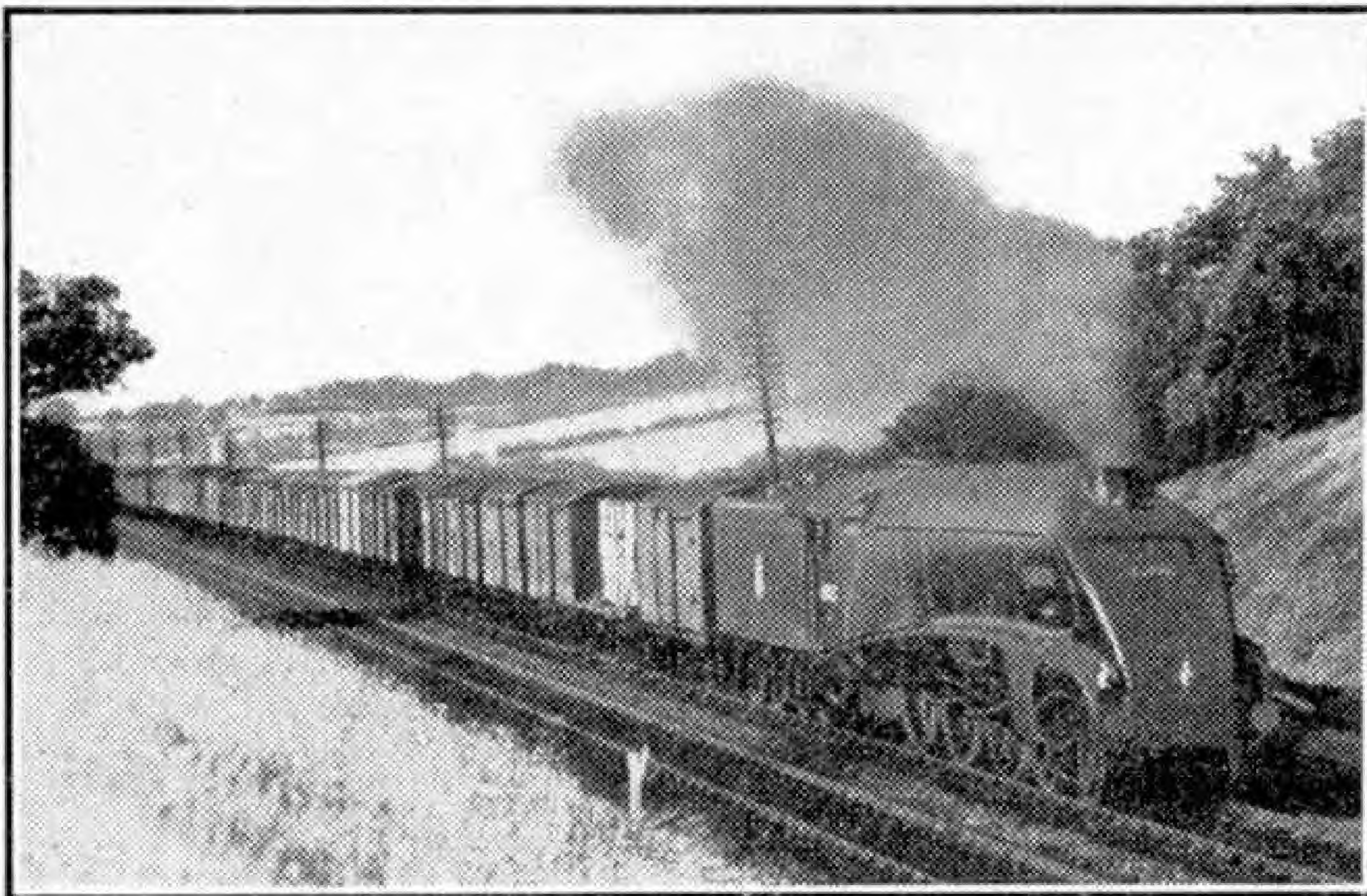
Railway Notes

By R. A. H. Weight

Diesel-Electric Express Sets for Egypt

British Manufacturers have many overseas orders on hand for steam, diesel-electric or electric locomotives, together with powered train sets or railcars, as well as coaching stock of various types. Notable among these is the diesel-electric construction for the Egyptian State Railways, already partly completed and in service, including express and shunting locomotives and main-line and suburban railcar or train sets.

On a Sunday in December last, trial runs took place on the Western Region lines between Birmingham, Kidderminster, and Droitwich Spa and back with a novel and handsome diesel-electric articulated railcar set. This consisted of five coaches, weighing in all



A southbound fish train near Retford, Eastern Region, hauled by No. 60032 "Gannet." This photograph is specially interesting as it was taken by "M.M." reader Michael D. Dove with a camera constructed by himself.

152 tons. Diesel engines, electric transmission and control gear had been supplied by the English Electric Co. Ltd., coachwork and bogies by the Birmingham Railway Carriage and Wagon Co. Ltd., and air-conditioning plant by J. Stone and Co. Ltd.

Most comfortable accommodation is provided for first and second class passengers; there is a buffet, with kitchen and refrigerator, a luggage compartment and a 400 h.p. diesel engine with driving gear at each end. The whole forms what might be called an all-metal "Quintuple" unit of striking appearance, 255 ft. long. The set, with others, is intended for fast services over the 130-mile route between Cairo and Alexandria, long the scene of 4-4-2, 4-6-0 and other steam locomotive operation.

The First B.R. New Standard "Pacifics"

As we write, news is coming in of the initial trial runs with the first two engines of the medium class "7" 4-6-2, which inaugurates the British Railways standard types for general service. The pioneer engine, No. 70000, was named "Britannia" by the Minister of Transport when it was at Marylebone station for inspection on 30th January last. "Britannia" had been chosen as a traditional engine name, and also as a link with the Festival of Britain.

There are to be 25 of the 70000 series built at Crewe; the first ones will probably soon be working

on the Great Eastern Section of the Eastern Region where train service improvements, with regular interval timing of expresses on an extended scale, are contemplated. We hope to publish further details and illustration shortly.

Liverpool Street, Above and Below

The famous City of London terminus, Liverpool Street, which used to handle the most intensive steam suburban services in the world, is still very busy in that way on its west side, serving the Enfield and Chingford lines. On its eastern side, however, electrification has provided frequent overhead-traction trains running to and from Shenfield and intermediately, along the main lines. Longer-distance and other steam services are still to be found in plenty and much smartening-up has taken effect.

Great developments have also been taking place beneath the station or nearby at sub-surface or lower level, as there is much interchange of passengers with London Transport railways and trains. A new ticket hall has been opened under Liverpool Street with ticket booths, escalators and so on, effecting

quick connection between Liverpool Street main line station and Broad Street, L.M.R. terminus, which is adjacent, and the Central line "Tube" and the Metropolitan Circle line platforms and trains. Central line trains serve Eastern Region suburban stations as well as a considerable portion of the West End and western outskirts of London.

Western Tidings

It is of particular interest to note that on the occasion of the visit of H.R.H. Princess Elizabeth to Swindon in November last, to which reference was made in a previous issue, the ordinary trains by which the Royal party travelled, in a specially attached portion, from and to London were hauled by the 36-year old "Star" class 4-6-0 engine, No. 4057 "Princess Elizabeth," with loads which cannot have been far short of 400 tons. In each direction

there was a slight gaining of time, which was creditable to the veteran member of a famous class now being depleted by scrapping.

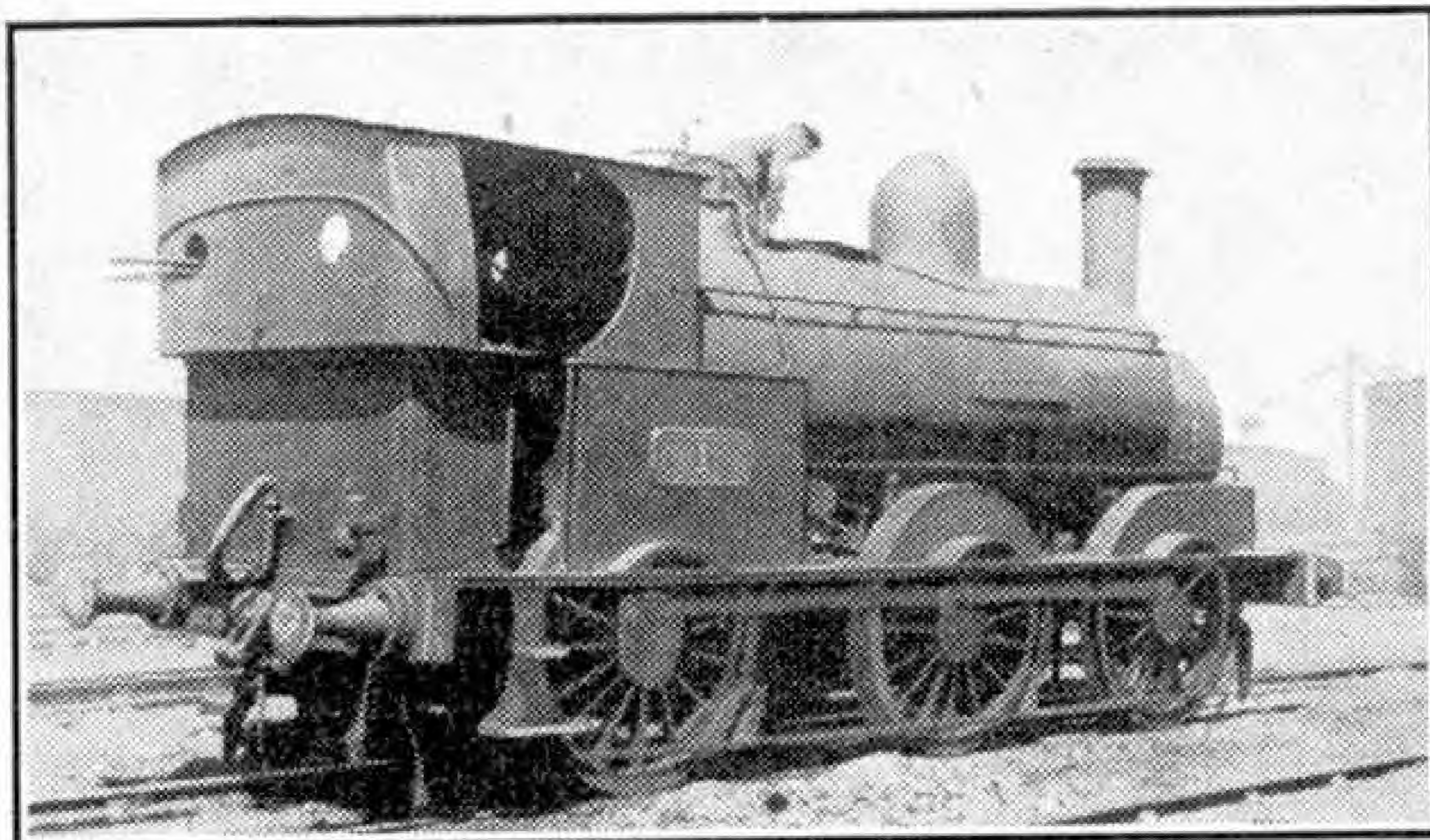
It is perhaps rather a melancholy thought as we record the completion of No. 7929 "Wyke Hall," stationed at 84E, Tyseley, and of No. 7829 "Ramsbury Manor," soon after "Castle" class 4-6-0 No. 7037 "Swindon," that these engines are in each case probably the last for main line work to be constructed to Great Western design, embodying Swindon traditions of appearance and equipment long so familiar. No. 7037 carries the Swindon borough coat-of-arms on the centre splashers below the name of that town.

The new "Manors," Nos. 7820-9, carry the following names in order: "Dinmore Manor," "Ditcheat Manor," "Foxcote Manor," "Hook Norton Manor," "Iford Manor," "Lechlade Manor," "Longworth Manor," "Lydham Manor," "Odney Manor" and "Ramsbury Manor." Some are stationed at 89A, Oswestry, for work on the Cambrian section.

There are now 330 "Halls," including 72 of the newer modified series; 170 "Castles," 80 "Granges"; 30 "Manors"; 30 "Counties."

More 0-6-0Ts placed in service from Swindon or contractors' works include Nos. 6772-9, 8424, 8465-6, 9431-3.

Nos. 6102 and 6107, large 2-6-2Ts of the class more usually confined to London district passenger



A veteran saddle tank locomotive built at Crewe in 1873 for service on the Dundalk, Newry and Greenore railway. It was photographed in July 1949 by E. M. Patterson, St. Andrews.

services or associated workings, were lately noted at Bristol.

For some time W.R. engines have been running regularly to Leicester, E.R., at night on through west-north trains, operating from Swindon, travelling by way of Oxford, Banbury and Woodford. It thus seems that the alternate arrangements of perhaps yearly spells of using L.N.E.R. and G.W.R. locomotives for these duties is being continued by British Railways.

As upper-quadrant type signals are gradually to become general, when replacements are needed some may soon be seen on the Western Region, though the traditional G.W. lower-quadrant semaphores will probably be familiar for a considerable time yet.

London Midland Regional News

No. 10800, the 827 h.p. diesel-electric light mixed traffic locomotive, has lately been undergoing extensive trials and has demonstrated considerable versatility in capacity. It was built by the North British Locomotive Company, is carried on eight wheels, and has a Davey Paxman 16-cylinder diesel engine which drives traction motors mounted on each axle. British Thomson-Houston power equipment is included; there are five driving speeds and the maximum starting or tractive effort is 34,500 lb.

No. 10800 has travelled at well over 60 m.p.h. with light passenger trains and recently made a fast demonstration run with four coaches from Euston to Watford and back, afterwards working on branch lines from Bletchley. It has done service between Derby, Kettering, Nottingham and elsewhere, as well as hauling a parcel train over the steeply-graded Derby-Manchester main line. For the winter season, the large diesel-electric engines, Nos. 10000-1, have again been noted singly working fast goods trains. They are expected to be joined by the similar machine recently completed at Ashford and destined, it is understood, for L.M.R. service this year.

The "Turbomotive" No. 46202 has been dismantled at Crewe for some time. Unrebuilt "Royal Scots," including several which have been painted dark green, have been noted running Euston-Birmingham-Wolverhampton expresses.

Midland Compound 4-4-0s are

reported to be working from Southport among their Cheshire Lines duties. Only one L.N.W.R. type class "7F" 0-8-4T remains in service. This is No. 47931, actually built after the grouping in 1923. It was lately noted at Edge Hill, Liverpool, repainted and with B.R. emblem on return from Crewe.

New locomotive construction continues at Crewe, Derby and Horwich. Engines lately placed in service are numbered and allocated as follows: Class "2" light 2-6-2T; No. 41284, 25A, Wakefield; Nos. 41285-9, 5A, Crewe; class "4" 2-6-4Ts: Nos. 42061-5, 5D, Stoke; class "5" 4-6-0 mixed traffic with roller bearings for driving axle; Nos. 44693-5, to 25F, Low Moor, followed by 44696/7 at 26A, Newton Heath.

As from 1st January this year some locomotive classifications have been altered, classes "5XP," "6P" and "7P"

becoming "6P," "7P" and "8P" respectively.

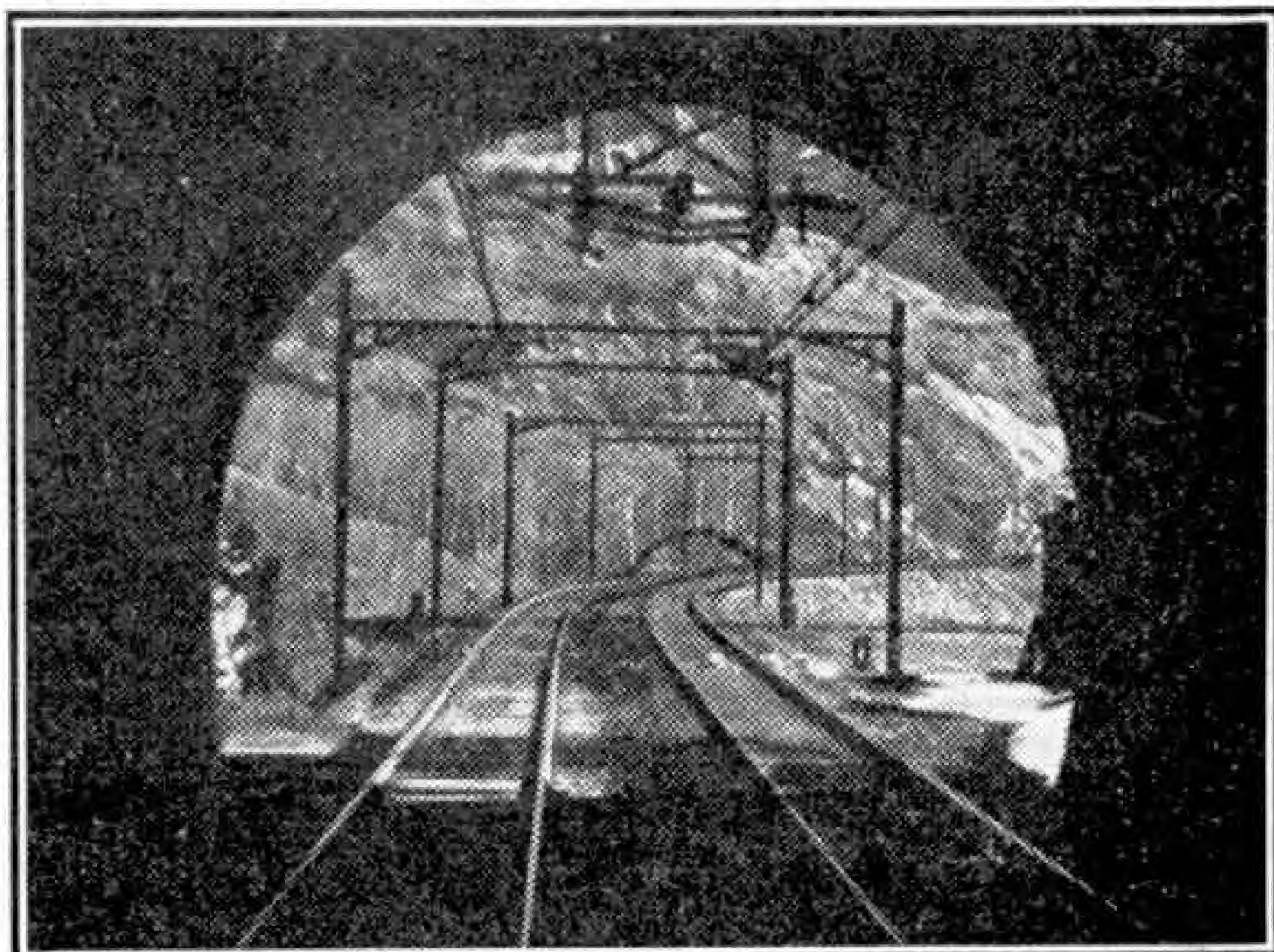
Nos. 42057-60 of the class "4" 2-6-4T series, built at Derby for service in the Scottish Region, are shedded at 66A, Polmadie, Glasgow.

A Quaint Little Railway

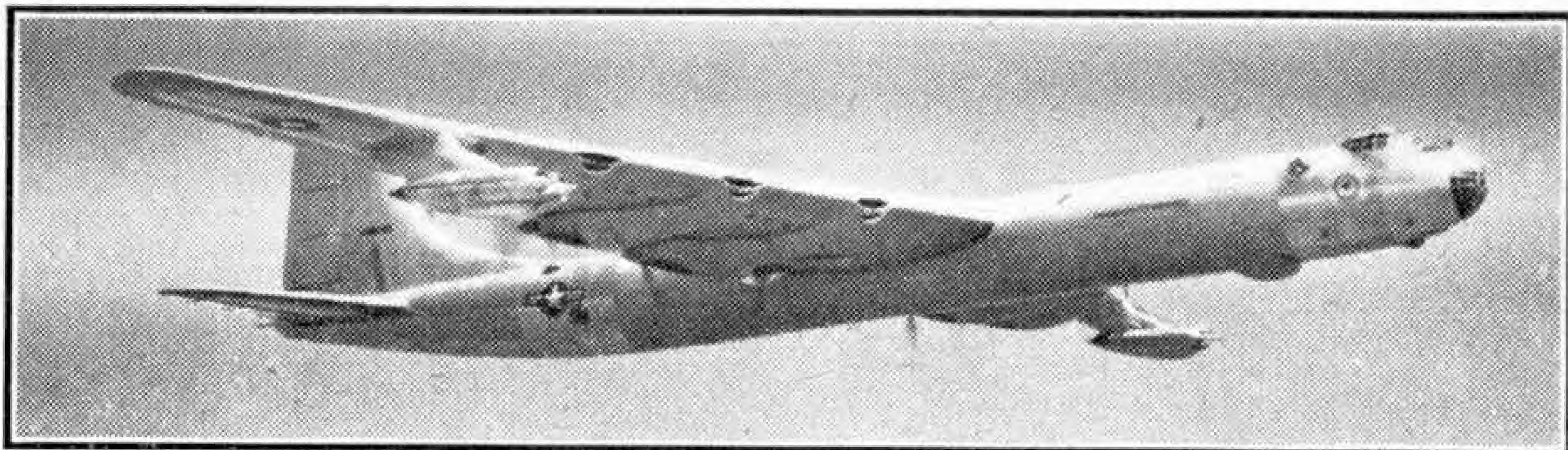
The number of odd little railways in England is now one less as a result of the closing on 4th December 1950 of the Sheppey Light Railway (Kent). This line, about 8½ miles in length, running from Queenborough Junction to Leysdown with six intermediate stops, was opened on 1st August 1901. On 3rd October 1905 it was absorbed in the S.E.C.R. later to become a part of the Southern Railway and then British Railways (Southern Region).

The journey took about 35 minutes and as some of the stations are quite a distance from the villages, it is hardly surprising that most people preferred to travel by bus. In fact it was not unusual, in the winter, to find no one using the line at all.

The line crossed the road by means of level-crossings at several places and the Guard would dismount, open the gates, allow the train to pass, close the gates and rejoin the train. (T. C. BRYANT).



A remarkable tunnel view on the Swiss Federal Railways, taken from the cab on the St. Gotthard route by T. C. Bryant, Minehead.



Convair's "Big Three"

By John W. R. Taylor

BACK in the early days of this century, when world wars occurred only in the novels of H. G. Wells, U.S. President Theodore Roosevelt gave his formula for preserving the peace: "Speak softly, but carry a big stick." Unfortunately, the people who took his advice and acquired "big sticks" were not the type to "speak softly." They preferred to use them to attack their neighbours, and first the Kaiser, then Hitler plunged the world into war.

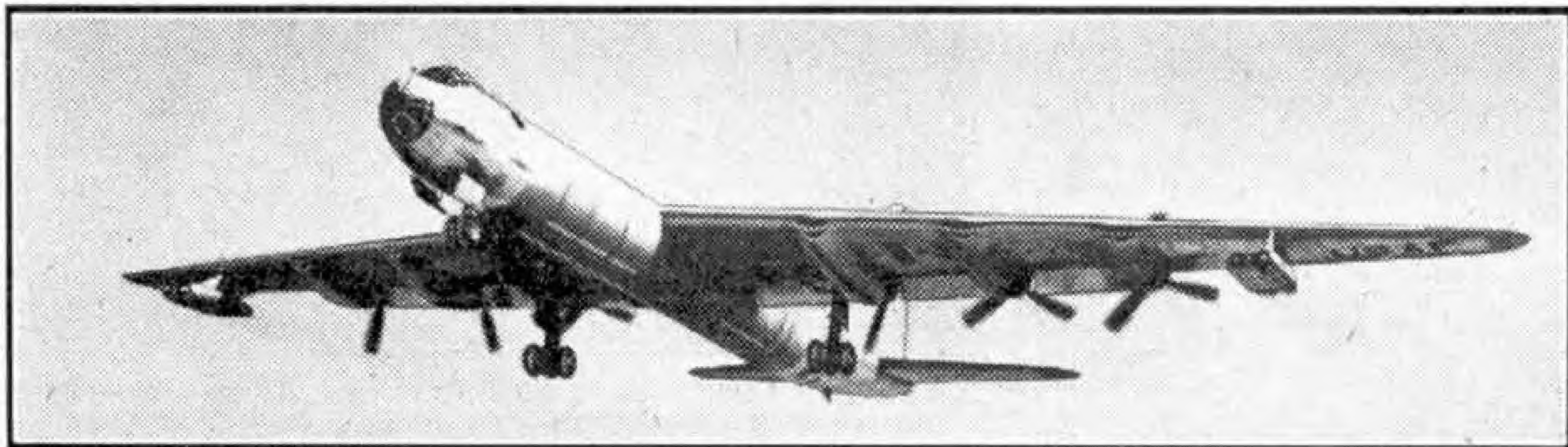
Their "big sticks" consisted of vast, well-equipped armies and deadly packs of U-boats, and they came within a hair's breadth of conquering Europe and, perhaps, the world. But gradually a new type of "big stick" was shaped in the form of the strategic bomber force, and it was with a single terrible stroke of this weapon at Hiroshima that the United States ended World War II. Since then, the U.S.A.F.'s Strategic Air Command, vehicle for the atomic bomb, alone has probably averted the catastrophe of a third world war.

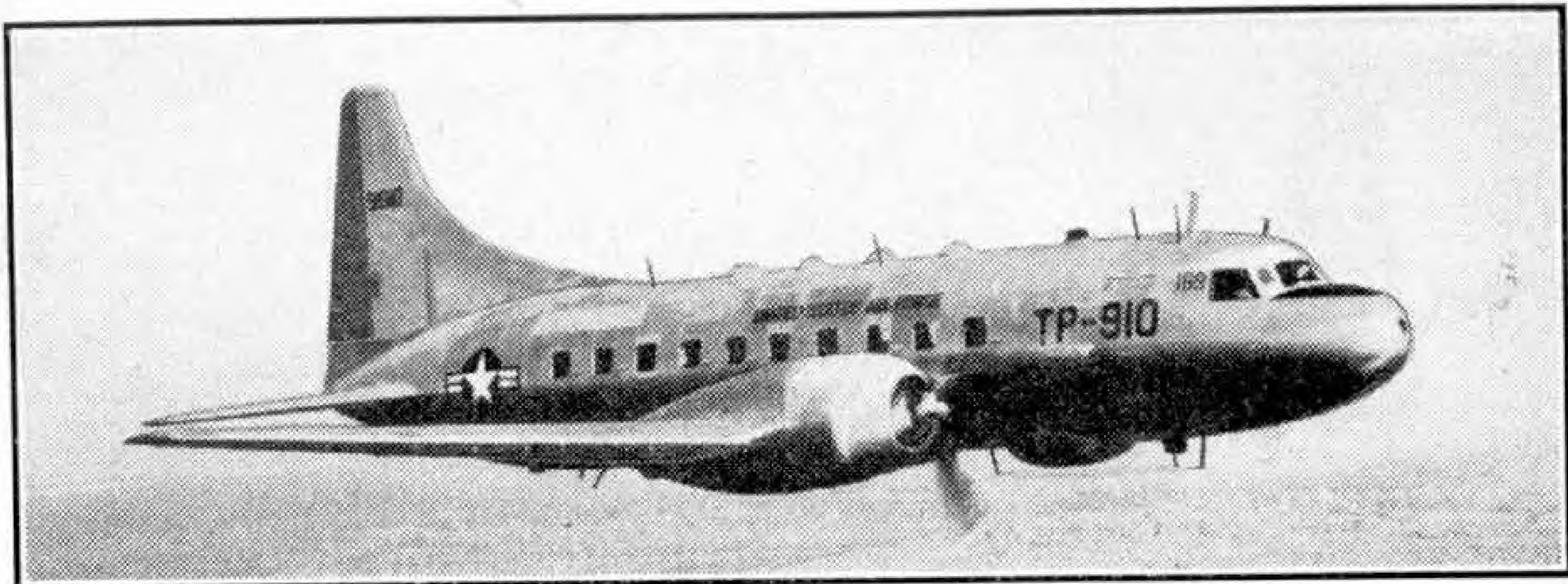
The heart of that Command is its force of mighty Consolidated-Vultee B-36

bombers, whose long slender fuselages might almost be winged replicas of "Teddy" Roosevelt's "big stick." Certainly they represent the most formidable aerial weapons ever built, for each of these 10-engined giants is as big in span as the "Brabazon" and capable of carrying an atomic bomb. They are so big that, at one time, it was planned that each should carry a personal defence fighter 'plane tucked away in its bomb-bay, which could be air-launched to protect it in action. But this project has now been abandoned as, in addition to problems encountered during flight trials with the tiny McDonnell XF-85 parasite fighter, the B-36 has proved quite capable of taking care of itself with the aid of its sixteen 20 mm. radar-aimed cannon, mounted in retractable turrets.

The B-36 is by no means a new aeroplane, and was actually designed ten years ago, the prototype contract being signed by General Arnold a few weeks before the Japanese attack on Pearl Harbour in December 1941. Design requirements called for a range of 10,000 miles with 10,000 lb. of bombs—sufficient to reach

The photographs on this page give a good idea of the great size of the Convair B-36D 10-engine bomber. The illustrations to this article are reproduced by courtesy of the Consolidated Vultee Aircraft Corporation, U.S.A.





Convair T-29 navigation trainer, the first U.S. aircraft designed specially for training navigators in groups.

Europe or Japan even if bases were not available in Britain or China.

B-36 development proceeded steadily throughout the war, during which Convair gained vast experience in bomber design and production, first with the "Liberator," of which more than 19,000 were built, and then with the "Dominator," which was comparable with the "Superfortress" in size and offensive power. Lessons learned in air combat over Europe and the Pacific were built into the embryo XB-36, which flew for the first time on 8th August, 1946.

From the start it caused a storm of controversy. Money for defence needs

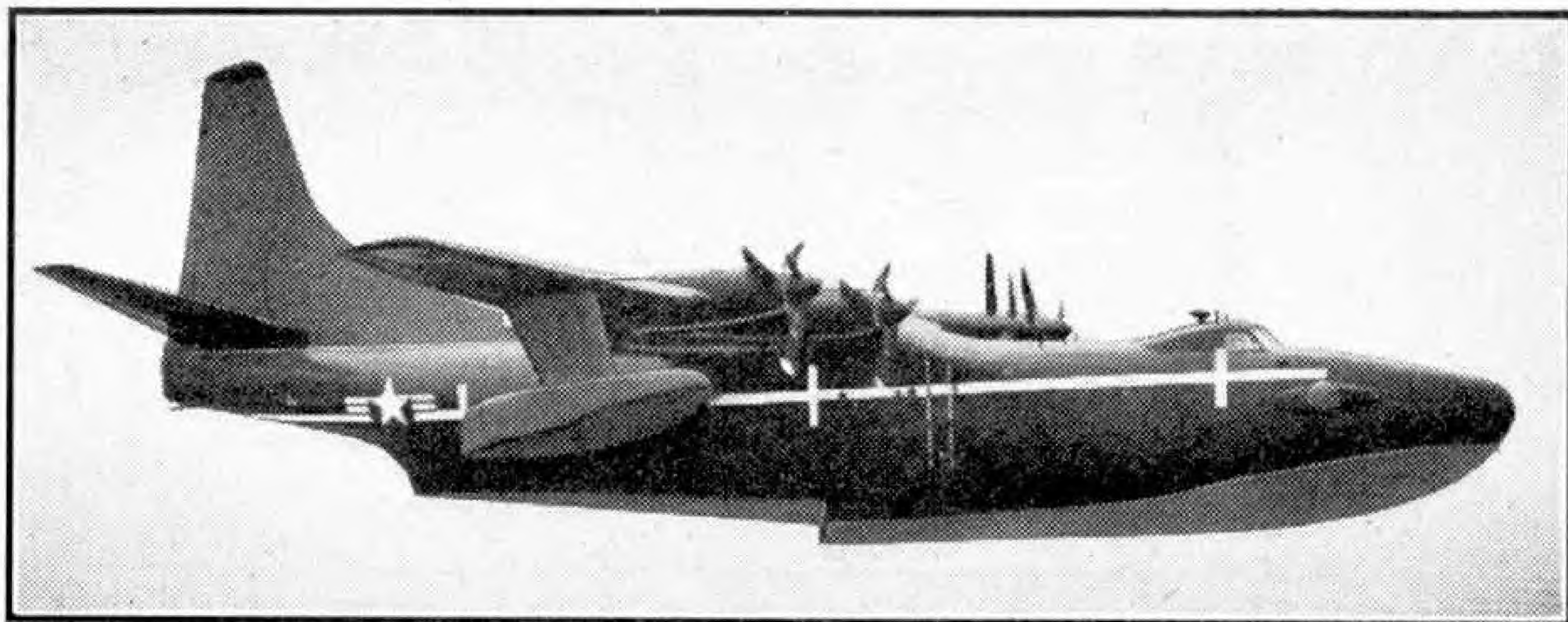
was short, and the U.S. Navy in particular resented the expenditure of well over £1 million each on "lumbering six-engined flying battleships" at a time when the Navy were refused money to build their own projected super-carrier. In its defence, the U.S.A.F. claimed that a heavily-armed B-36 flying at 40,000 ft. could not be intercepted successfully by any fighter. The Navy replied heatedly that they would gladly prove the B-36 a "sitting duck" target for their "Banshee" fighters at any time, by intercepting it at 40,000 ft. "with live ammunition if necessary!"

Nevertheless, the B-36 was put into immediate production and soon proved its capabilities. Interception tests showed that it could almost certainly beat off jet fighter attacks above 40,000 ft., where the fighters lacked manoeuvrability. Its offensive power was demonstrated on 10th March 1949 when a B-36 took off from Caldwell Air Force Base, Texas, carrying 10,000 lb. of bombs and full battle equipment, and returned 43 hr. 37 min. later after flying non-stop 9,600 miles. It still had several hours' fuel left in its tanks, but was minus bombs and dummy ammunition which it had dropped at the halfway mark. Another B-36 carried and dropped no less than 42 tons of bombs at a distance of 1,500 miles from its base.

Altogether 22 of the original production B-36As were built. They carried no armament and were intended chiefly for crew training, but are now being converted into RB-36E reconnaissance-bombers. They were followed by the fully-operational B-36Bs, of which 74 were ordered, and which had six 3,500 h.p. "Wasp Majors," compared with the 3,000 h.p. "Wasp Majors" fitted to the B-36A. The B-36C was a projected version with six compound engines driving tractor propellers, but was



Inside the T-29 "flying classroom," showing students receiving instruction in air navigation.



The Convair P5Y-1 propjet-powered flying boat.

never built. Instead, production is now concentrated on the B-36D, which has four General Electric J-47 turbojets slung under its wings in addition to its piston engines, to give it an over-the-target speed of 435 m.p.h. at 50,000 ft. In parallel production is the RB-36D, a virtually similar strategic reconnaissance-bomber with new snap-action bomb-bay doors, which open or close in 2 sec., and which carries 14 cameras in its forward bay. All RB-36Ds and RB-36Es have added jet power like the B-36D.

Each B-36 carries a crew of 15, including a 4-man relief crew, and this has naturally put a strain on the U.S.A.F.'s training resources. This is especially true of navigators, the key men of modern bombing crews. It is the navigator-bombardier who directs the course of the bomber to its target, determines at which point it must begin its bombing run and when and where the bombs will drop. He then has the responsibility of directing the bomber home by the safest route.

To cope with this problem, the U.S.A.F. held a competition in 1948 for a large training 'plane in which several pupil navigators could be trained at once by a single instructor. It was won by Convair with a military conversion of the superb "Convairliner," and this is now in full production as the T-29A.

Externally the T-29A is almost identical with the air liner, but internally there is no resemblance, the 40 luxurious passenger seats having been replaced by 14 fully-equipped stations for students or instructors, and one radio-operator's station. Each student has access to a map table, Loran scope, altimeter and radio compass panel, and there are four astro-domes in the roof through which

sextant sightings can be made. The T-29A carries sufficient oxygen for 6 hrs.' duration at 20,000 ft. for high-altitude training, and can be used also for pilot and flight engineer training.

Nor is that the full extent of Convair's present military production, for they have just received a U.S. Navy order for ten of their large P5Y-1 propjet-powered flying boats. These aircraft are very different to the wartime Convair "Catalinas" and "Coronados," and are certainly the most advanced flying boats in the world to-day. As can be seen in the illustration on this page they have beautifully clean hulls, and are powered by four 5,500 Allison T-40 power units, each of which consists of two T-38 propjets coupled together to drive a single set of contra-props. So they are really 8-engined machines, and this fact, combined with fine streamlining, gives them a speed of over 350 m.p.h.

Many people still believe the flying boat to be unrivalled for long-range anti-submarine and sea patrol duties, and the powerfully-armed P5Y-1 should do much to enhance that reputation. Certainly the flying boat is unmatched for mobility, as the Korean War has shown, for two squadrons of "Sunderlands" were the only R.A.F. machines that could be sent to the front in time to play a major part in the Allied air counter-offensive.

Beyond these magnificent aircraft a new generation of Convair warplanes is under development. There are rumours of a swept-wing propjet-powered B-36, armed with rocket-guns, and the experimental Convair XF-92A delta-wing research monoplane may be a preview of even more startling developments, aimed at keeping Uncle Sam's "big stick" heavy enough to preserve the peace.

Collecting Feathers

By L. Hugh Newman, F.R.E.S.

I WONDER if you have ever thought of making a collection of feathers? They are very beautiful things and there are one or two points about collecting them that make this hobby very attractive. In the first place, you can find feathers almost anywhere, and can start collecting them at any time of the year. Begin by looking in your back garden, then out on the road, in fields, hedgerows and country lanes, on hillsides, commons and heaths and, perhaps the best places of all, in woods and forests. They don't cost anything at all; you just pick them up and pocket them! And then there are so many different kinds of birds in these Islands, such as the migrants that you only see at certain seasons, the sea birds round our shores, and all the resident species, with which you can make the foundations of quite a good collection in a very short time.

I began to collect them quite by chance a few years ago. I had gone down to the lovely old cathedral city of Wells for my summer holidays, and in the house where I was staying there was a young fellow who had permission to row on the moat that surrounds the Bishop's Palace. It had been frightfully hot and stuffy coming down by train from London, and so when Peter, my young friend, said to me after tea, "Would you like to come for a row on the moat?" I simply jumped at the chance.

We hopped on our bikes and flew down the long hill leading into the city, and soon landed in the cool shade of the outer gardens round the Bishop's Palace. The public were allowed in here, and little parties sat about on the grass, or stood by the edge of the moat watching

a pair of stately swans and their brood of funny looking grey cygnets. We got off and pushed our bikes across the draw-bridge, and Peter unlatched a small heavily studded wooden door, low down in the huge imposing Palace Gates. It opened with a loud creak as it swung back on rusty hinges, and we had to double up and bob our heads to pass through into the inner courtyard.

In the distance I could hear a waterfall, where the famous Wells springs splashed down into the moat, keeping the waters always clear, fresh and icy cold, even in the hottest summer weather. So we strolled down to the little rustic bridge that spans the moat at one point, and Peter untied the boat and I scrambled in. With a few deft strokes of the oars

we were soon in deep water and I could see the fine towers and pointed pinnacles of Wells Cathedral at their very best, as though in a picture, framed between tall waving pampas grasses planted along the banks.

But I must confess I'm keener on Nature than on the finest architectural beauties, and so I turned away to look at the birds and fishes instead. The first thing that caught my eye was not a fish or a bird; it was only a feather, but what a feather! It floated on the water like a little sailing boat turned

over on its side, for it was a long white feather from the wing of a fully grown swan. I picked it up and it came out of the water almost dry; just a tap, and the drops fell off its naturally smooth surface like pearls rolling off a sheet of glass.

It was a beautiful feather, with a thick round quill that our ancestors would have been glad to find and make into



Feathers from the grey hawk mounted on an album page.

a pen. I ran my hand up the length of it, and where it was slightly torn it joined again as if by a miracle. But of course it wasn't a miracle; it was just the way a feather is made. The vane—that is the soft broad part of the feather—is made up of hundreds of tiny barbules, and along each one are sharp barbs that are made in such a way that each hooks on to the one next to it, and so on all the way up the feather right to the top. That is why birds take such a long time each day preening their feathers. With the stroking movements of their beaks they join up those little hooks that have come undone, so to speak, just in the same way as they were joined when I ran my hand up the length of the one I picked out of the moat.

Now here's another very curious thing about feathers.

This interlocking arrangement of the vane of a bird's feather forms a very strong surface, one that resists the wind and assists the bird to fly. But with birds that don't fly, such as ostriches, the emu and cassowary, the wing feathers have no hooklets to the barbules, and the disconnected ragged barbs give their plumage their characteristic "fluffy" appearance. As a matter of fact nearly all birds have some of these fluffy feathers, but they are usually hidden underneath the ordinary ones. They are the down feathers that help to keep the birds warm, and keep you warm too when they are made up into eiderdown quilts!

Before we left the moat, Peter suddenly remembered that there was a kingfisher's nest in a hole in the bank, and as I'd told him I was now going to start collecting feathers he suggested we had a good look round. We found the hole leading into the nest all right, but I couldn't get my hand inside to feel for dropped feathers as it was in such an awkward position. But Peter had a better idea. "Let's

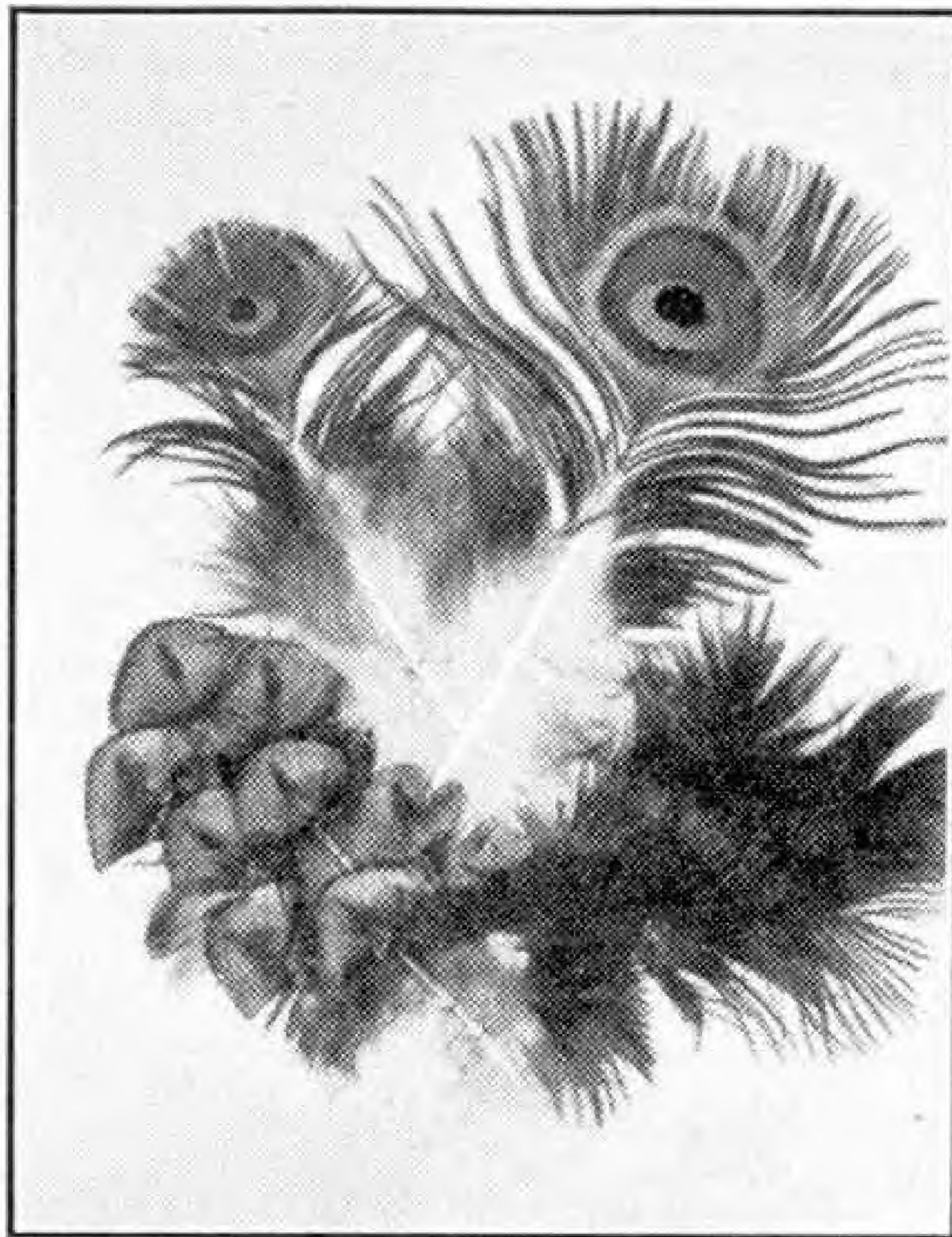
search by the spot where I've often seen the bird perching." When we got there it was not at all the conventional perch of a kingfisher, which is usually a low bough of a tree overlooking water. No, this was just an old wooden soap-box upended by the water's edge.

There was plenty of evidence that this was the bird's favourite perch, and round about on the ground I found quite a number of the lovely greenish-blue and black wing quills, and one obviously from the tail, spotted with brilliant azure blue.

I felt this was a pretty good start for my collection of bird's feathers from this district anyhow, but Peter drove me on to gather up all the duck's feathers we could find amongst the grass. They were rather a disappointing lot, mostly dull browns or dirty white or black, and rather ragged and

torn, as it was the moulting season. But we got one fine one from the wing of a wild drake. It was a beautiful ash-brown with a broad bar of purplish or almost violet blue towards the end. What I really wanted were some of the tiny feathers on a drake's head; these are deep bottle green in the mating season, but they are so light and fragile that they probably get blown away when the bird moults them.

From that memorable day onward, for the rest of my holiday, we spent most of the time looking for feathers. There were some very definite rules that we made. No bird must ever be killed or even caught in a trap to increase the collection; the feathers must all be just picked off the ground, or out of a deserted nest. We made an exception of a bird found dead, killed by a fox or marauding cat, but when we did find one of these, which I am glad to say wasn't very often, they were usually in far too bad condition for the feathers to be of any use for my collection. I doubt, however, whether I should have



This arrangement of peacock's feathers includes brilliant green, blue and bronze plumage as well as the beautiful "eyed" feathers of the train.

got my quota of glorious jay's feathers if we hadn't come upon a gamekeeper's gibbet. I took two wing-coverts, superb clusters of feathers made up of alternate bars of pale blue, deep sky blue, and black.

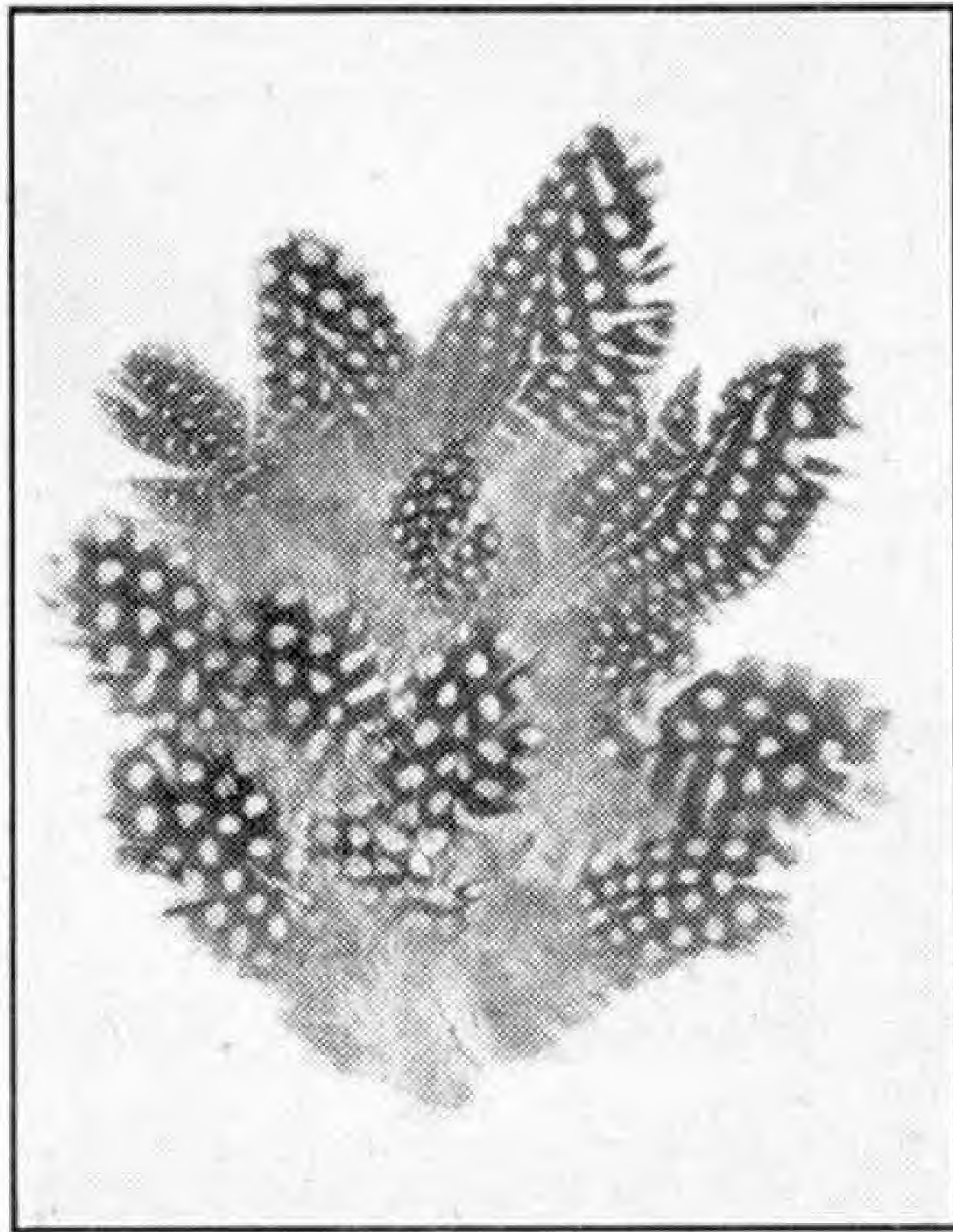
I soon found that this was a fine part of the country for bird life, although we were too far away from the sea to add any sea bird's feathers to my ever-growing collection. In the woods nearby I found feathers of both the ring dove, or as it is perhaps more commonly known, the wood pigeon, and the tawny or wood owl. The pigeon is called a pest by farmers, but this doesn't make it any the less beautiful, and I rank its glossy green and purple neck feathers quite high in my collection, while the wide soft, grey tail feathers are a delight to stroke.

I never realised how differently marked owl feathers are from those of most birds until I found a tawny owl's. The one I have is, I should think, from the wing. It is barred, with alternate white and dark brown streaks on the wide side of the feather, while on the other, the narrow side, it is rusty or tawny-brown and dark brown in an absolutely regular pattern. Before I went home a farmer took me up into a loft of an old barn, where barn owls had nested regularly for generations. Here I found a fine selection of feathers from different parts of the bird's bodies, all very characteristic of this bird, which is quite differently marked from any of the other British owls.

We visited a rookery in the neighbourhood, and there I found some fine glossy-black rook's feathers on the ground beneath the trees where they nested. On that same trip I picked up, quite by chance, a feather of the greater spotted woodpecker. There was not the slightest doubt about this one, as it was black, variegated with white spots, and Peter had often seen the bird in the vicinity.

Of course all the time I was adding feathers of the more common smaller birds to my collection, such as the sparrow, hedge-sparrow, chaffinch, great tit and coal tit, the tiny wren, the skylark and the bullfinch. In nearly every case it meant quite hard work. We had to find a locality where the birds lived and hunted for food, and then in the evening watch where they went to roost. Often round about their sleeping quarters was the only place we could pick up an odd feather or two of the particular species of bird that we were watching.

And now something about how to mount feathers. Peter and I discussed it at great length, often far into the night! We made a number of experiments, such as mounting each one separately on sheets of white paper; but in the end we found the best way was to treat rather them like photographs, sorting them into sizes so that they fit nicely into each page of an album. Instead of sticking them down, which was not at all satisfactory, we decided to cut a narrow slit in the page where each feather was to go, and push the pointed end of the quill



The greyish plumage of the guinea fowl, speckled with white spots, makes an attractive display.

through it, fixing it at the back with gummed paper. And then higher up the feather, about two-thirds of the way from the top, one stitch across the mid-rib held it in place. Sometimes we found it more effective to group the feathers together in the centre of the page so that they formed a definite pattern, which curiously enough then often resembled a flower in bloom!

Later on you might care to go further into this business and swop feathers with friends in other parts of the country, or even abroad. Even the Golden Eagle is not an impossibility if you could get to know a naturalist who was attempting to photograph the bird and its nest. He would surely spare the time to pick up a feather or two for you.

The Last of the Ivatt "Atlantics"

By "North Western"

IN November last year, as recorded in *"Railway Notes"* in February, the last Ivatt "Atlantic" to remain in service, B.R. No. 62822, made its final run down the main line from King's Cross to Doncaster. To mark the occasion, in view of the remarkable service rendered by the "Atlantics" as a class, first in Great Northern days and then in the L.N.E.R. period, the Eastern Region authorities with commendable enterprise made arrangements for the engine to work a special train on this final journey. An illustration of the train accompanied the details given last month by Mr. R. A. H. Weight.

I was particularly glad to be able to travel by this special; it was my first run behind an "Atlantic," and my last, but it was at no funeral pace that the 45-year-old engine, No. 294 of G.N.R. days, took us along the route that must have become so familiar to her. For an engine that had cost but £3,350 to build, and had run 1,650,000 miles, she ran magnificently on this closing performance of her career.

Even young readers will know that the name "Atlantic" means a 4-4-2 tender engine, but they may not know that the first British engine of this wheel arrangement appeared on the G.N.R. in 1898 to the designs of Mr. H. A. Ivatt, then in charge at Doncaster Works. This was No. 990 which, like her 20 sisters built up to 1903, had a small boiler and a conventional narrow fire-box fitting between the frames. Outside cylinders were connected to the rear pair of driving wheels; the coupled wheelbase and leading bogie were compactly arranged; and the trailing wheels supporting the cab end of the engine ran between outside frames. Even before the last 10 of the small-boilered engines appeared No. 251, now preserved at Doncaster, had emerged to stagger the railway world of that time with what seemed an enormous boiler, with a total heating surface of 2,500 sq. ft. and a wide fire-box spread out across the trailing

frames. The "Atlantic" design had provoked comment from the first, for the cylinders were small by previous G.N.R. standards; on No. 251 they were still unchanged in spite of the much larger boiler provided.

The large-boilered design became the standard and building went on until 1910, when the last 10 "Atlantics" appeared with superheaters and bigger piston valve



The last Ivatt "Atlantic" in service, B.R. No. 62822, now withdrawn. The illustrations to this article are from B.R. Official Photographs.

cylinders. Superheaters were applied to the other engines over the years, some retaining their original slide valve cylinders. During the Gresley period the superheating equipment was enlarged from 24 elements to 32 in the whole large-boilered series, but not all of them were fitted with piston valves. Thus step by step the class underwent radical alterations internally. Scarcely any change was apparent in their external lines, however, and as No. 62822 came backing down into King's Cross on that foggy morning last November her appearance was recognisably "Great Northern," even though her old smart green livery had been replaced by a black coat. In view of the occasion she had been commendably cleaned.

The large-boilered "Atlantics" became firm favourites on the line and until fairly late in G.N.R. days were in the hands of individual enginemen, each of whom regarded his engine as his own.



L.N.E.R. No. 3284 at the head of the "Queen of Scots" Pullman, a duty on which the Ivatt "Atlantics" did some of their best work.

Grand runs these "owner-drivers" of the old days made at times, even with loads tremendously increased during the 1914 war, and "no pilot" was the rule until 1918. Then assistance from King's Cross out to Potters Bar was permitted, but only when the load exceeded 450 tons; and this was for a 4-coupled engine with an adhesion weight of under 40 tons!

With the introduction of "Pacifics" the Gresley "big-engine" era really got under way, and gradually it became possible to relieve "Atlantics" of the most arduous turns, but for years they made quite a habit of coming to the rescue of bigger engines when these had suffered some mishap. On one occasion in 1936, No. 4404 was put on to a 585-ton train of 17 coaches at Grantham at a moment's notice in the hands of a Gateshead crew, strangers indeed to a G.N. "Atlantic," and yet she made the run of 82.7 miles to York in 87 min. 40 sec., against the schedule of 90 min.

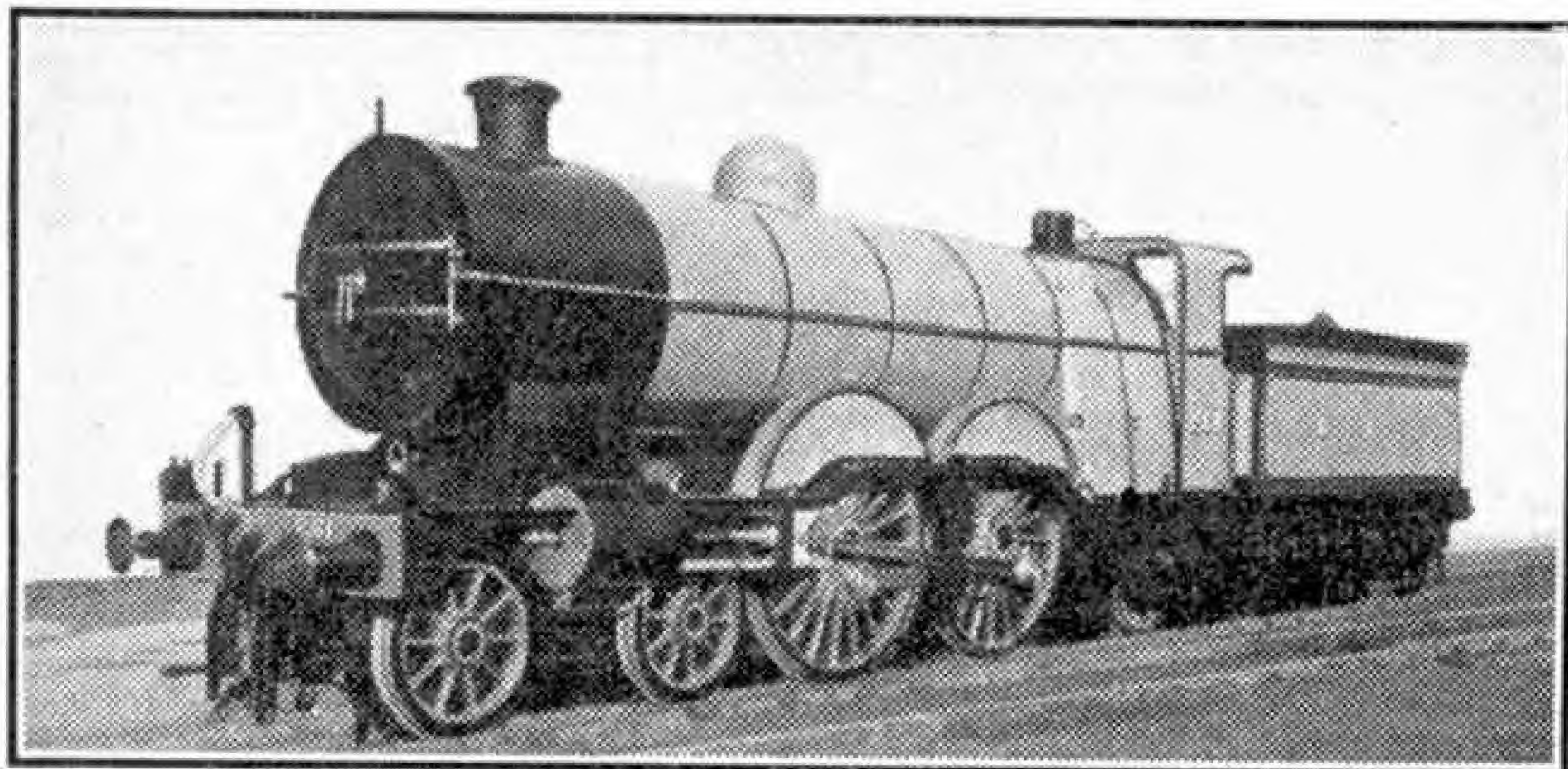
"Atlantics" also appeared in pre-war emergencies even on such a notably fast train as the "Silver Jubilee." Even as late in her career as last August, the last of her breed, No. 62822, took over a 509-ton train at her home station, Grantham, and kept schedule time to Doncaster without assistance.

The "Atlantics" won their greatest fame in

the running of the Pullman services between London and Leeds. Here was a job nicely within their capacity, a 7-car train of about 290 tons full on a non-stop run at 57 m.p.h. or so. Over and over again delays provided the spur for brilliant time regaining as, for instance, when in 1933 No. 3284, illustrated on this page, came up to King's Cross "Right time" in 175 min. instead of 193 min. for the 185 $\frac{3}{4}$ miles, after an 18 min. late start, two checks and the usual Peterborough slack.

Although "Pacifics" took over the Pullman workings in 1935, the "Atlantics" enjoyed a bright period on the tightly-timed Cambridge Buffet Car services of 1932-39 until war conditions put a stop to such joyous exhibitions. Under the stress of the times locomotive maintenance deteriorated. The elderly "Atlantics" were bound to suffer in such conditions, and in 1943 came the beginning of their end. No. 4459 was withdrawn and the others have followed in fairly rapid succession, except old No. 251, which has been restored as far as possible to its original condition and finish.

It was appropriate that at the conclusion of the last "Atlantic" journey No. 62822 steamed into the works yard and took up her position ahead of No. 251, which had been brought out of the paint shop for inspection. No. 251 looked almost unreal, so clean in G.N.R. green with red-brown framing, (Continued on page 142)



The first large-boilered "Atlantic," G.N.R. No. 251 as restored to its original condition for preservation.

BOOKS TO READ

Here we review books of interest and of use to readers of the "M.M." With certain exceptions, which will be indicated, these should be ordered through a bookseller.

"FOUR MAIN LINES"

By HAMILTON ELLIS
(Allen and Unwin Ltd. 16/-)

Here is the story of the four main lines of the British Railways system that stretch across the country from Euston, King's Cross, Paddington and Waterloo respectively. These great main lines of the former British railway companies concerned still retain much of their traditional character, and it is their individuality and character that provide the keynotes of Mr. Ellis's account of them.

The author loves his railways, and obviously wishes his readers to do so too. "What a lovely thing is a railway!" he exclaims, and this is the spirit in which the book is written. Not that it does not contain any criticisms, actual or implied; it does, but these are rather the understanding comments of the enthusiast. So he gives us a real story and not a mere chronicle when he takes his readers back to the beginnings of the routes concerned and traces the fortunes of the companies owning them during the century and a quarter before our railways came under national control.

The L.N.W.R. and the Caledonian, the two partners of the oldest trunk route from London, which became the West Coast Route, and their successors the L.M.S. give us the first section of the book. Here, as indeed in other sections, the men who engineered the routes, those who ran the systems and the trains they provided all come in the tale. Next we read of the building up of the rival East Coast Route from King's Cross, involving three main constituents, the G.N.R., N.E.R. and N.B.R. The big-engine policy of modern times on that line originated a hundred years ago with Sturrock's engines, notable specimens with large boilers and 150 lb. per sq. in. working pressure.

With the Paddington and Waterloo systems the approach is more intimate. Youthful journeys and life near a particular system frequently lead one to regard a particular line in a friendly yet almost possessive manner. So it is with the author. While admitting the greatness of the Great Western he reveals his special fondness for its neighbour and rival the London and South Western, which in due course became part of the Southern Railway. There are facts in plenty, not marshalled in dry formation but mixed with anecdotes and personal reminiscences.

The whole book, or just parts of it, can be read over and over again for entertainment as well as for information. In it there are plenty of excellent illustrations to delight the eye and arouse pleasant thoughts of the past, including eight reproductions in colour from the author's own oil paintings.

"AMERICAN CARS"

By RON WARRING
(Ian Allan. 2/-)

All car enthusiasts are interested in the motor vehicles produced in the United States, where the motor industry works on a colossal scale. There more than 100 million motor vehicles were produced between 1893 and 1950, and four out of five of the world's passenger cars are of American origin.

These figures and other information of deep interest are given by Mr. Warring in the introduction to his record of the American cars of to-day. This covers a wide range of makes, from the Buick, the Cadillac, the Chevrolet and the Chrysler to the Studebaker and the Willys-Overland. In each case details are given of the engine and chassis construction. Recognition features are dealt with, and reproductions of photographs show the various body styles for each make.

"THE WONDERFUL STORY OF THE SEA"

(Odhams Press. 12/6)

This wonderful story will provide lovers of the sea with a wealth of good reading, all authentic and full of variety. Mr. A. C. Hardy, the Advisory Editor, is well-known as an expert on ships and the sea, and those who have worked with him have compiled a record covering both the hard scientific developments of man's struggle with the sea and the stirring adventures of those who have ventured on it, whether in small vessels or in giant liners.

It is impossible to give here a full list of the many subjects dealt with. These range from the development of ships through the ages, the voyages of the early navigators and explorers of all countries and the building of ships, to the construction of ship canals, laying the first Atlantic cable and famous ports and docks. The perils that those who traverse the ocean highways encounter are dealt with in a special section, and we end with the romance of the Royal Navy, the story of Britain's fighting fleet since the days of King Alfred.

Its many pictures are a special feature of this comprehensive and informative book. Most of them are excellent reproductions of photographs, carefully chosen, and on the jacket of the book is a coloured reproduction of a picture of "The Royal Sovereign."

"AEROMODELLER ANNUAL 1950"

(Model Aeronautical Press Ltd. 7/6)

This Annual has become a firm favourite with model aircraft enthusiasts, and in this new edition they will find ample scope for the furtherance of their hobby. It is on similar lines to the previous two volumes, and contains plans of just over 40 model aircraft. These fine miniature machines are the work of aeromodellers in many countries, with Japan among the countries represented here for the first time.

The endeavour has been made to again cater for every taste, and there are items for Wakefield, Power, Control Line, Power Racing, Radio Control, Sailplane, and Indoor enthusiasts. There is an interesting article on Club Badges, and such regular features as the year's Contest Results, Engine Analysis, and British and International Records appear as usual. The many excellent half-tone photographs and line drawings add greatly to the value of the book.

"THE JOHNSON PHOTOCOPIA"

This is a companion volume to "The Johnson 'Wellcome' Photographic Year Book" reviewed in the "M.M." for January last. The Year Book contains light tables and calculator, and other helpful information the amateur photographer may need when out "hunting for pictures." The Photocopia includes that other information to which reference can be made at home or in the darkroom, and which if it were added to the Year Book would result in an unwieldy volume.

This supplementary handbook begins with an interesting chapter on simple composition for photographers, followed by others on choice of equipment and negative materials, exposure, focusing, the use of supplementary lenses and light filters, outdoor portraiture and photography by artificial light. Work in the darkroom is covered by chapters on development, processing at high temperatures, reduction and intensification. Valuable guidance is given on printing and enlarging, the making of lantern slides, and such after-treatment of prints and slides as glazing, toning and tinting.

The Photocopia can be obtained from all photographic dealers, price 5/-.

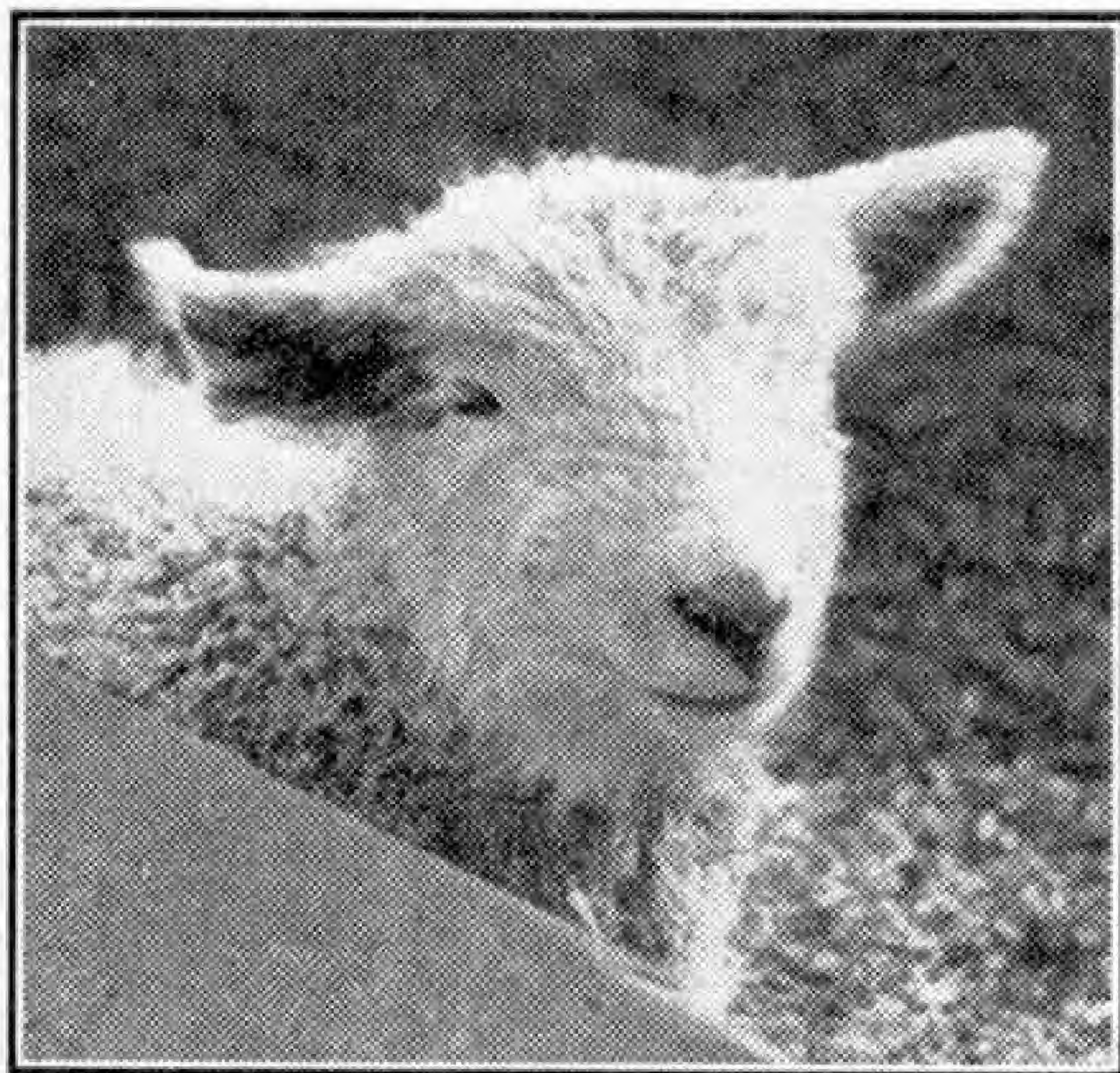
Photography

March Lambs

By E. E. Steele

ALTHOUGH the month of March brings uncertain weather, we definitely know that winter is on the way out, and there are many compensations, not least the lengthening days which give us more hours of precious daylight for our hobby. March, too, offers a great many subjects for camera work, the most attractive probably being the lambs, whose bleatings can be heard far and wide in the countryside. In a few weeks time they will have lost their early charm and become half-grown sheep, so now is the time to snap them at their very best.

The temptation is to nip over the nearest gate and flourish the camera at the first flock in which lambs are seen to be present. However, this will

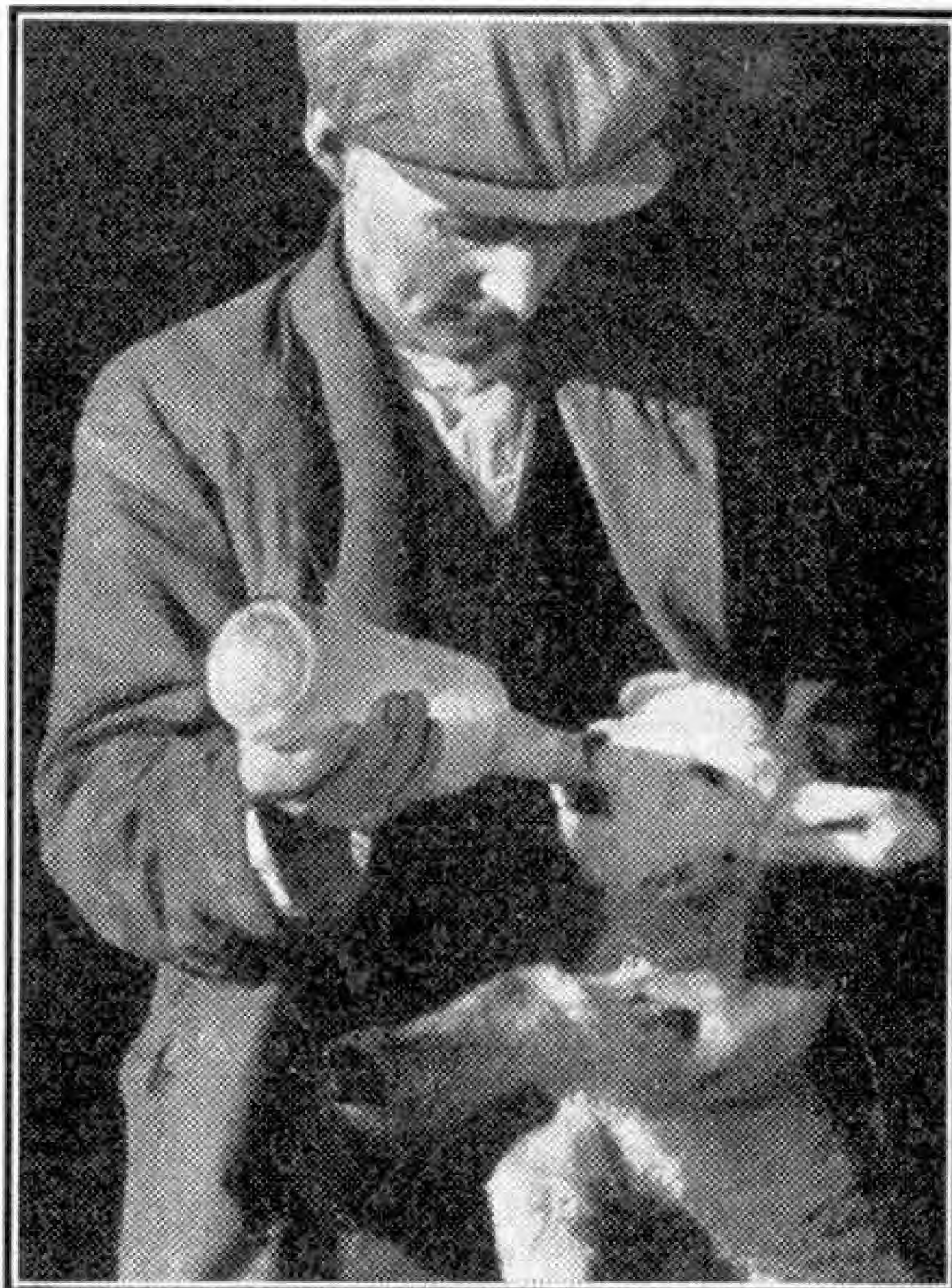


Good morning!

only annoy the farmer and seldom results in good pictures. Permission should be sought first or, better still, enlist the friendly aid of the shepherd who is easily found at this time, and will generally help you to make plenty of photographs. A flock of sheep is soon alarmed at the presence of a stranger, but if you are with the shepherd they will take little notice, and this will allow you to take some close-ups of individual lambs, which is much better than trying to get the whole flock in the picture when the lambs will appear too small to be pleasing.

Shepherds are proud of their flocks and will like nothing better than to possess a few photographs themselves, so try to spare a print or two, which will enable you to be on the best of terms with the shepherd when another year comes round. Furthermore, the old-time shepherd, like many good things of the countryside, is fast disappearing, and it is worth while to make a few pictures of him tending his lambs while he is still available.

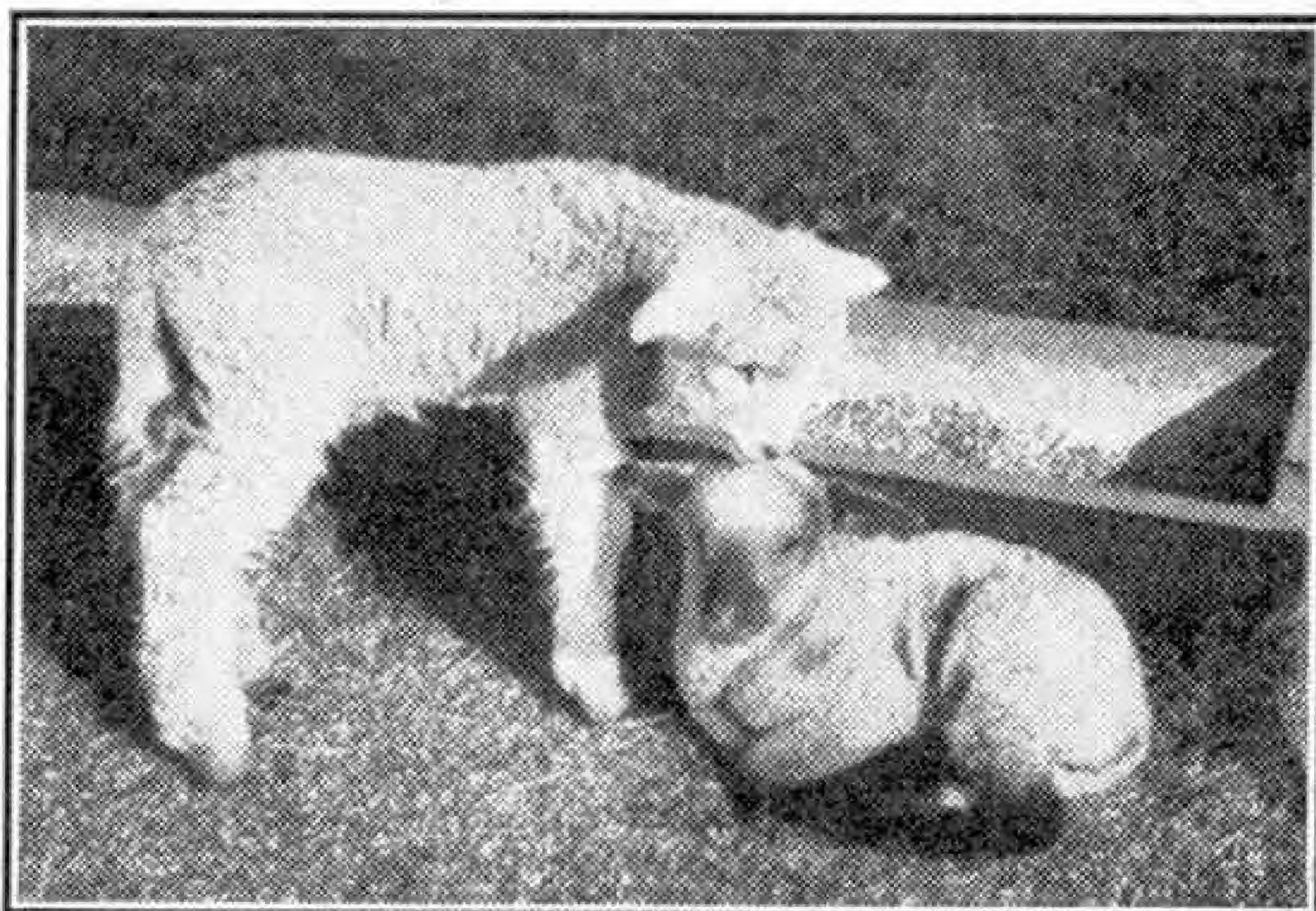
Photographing lambs in this way calls for no special camera or film, and good, sharp results should be easily obtained



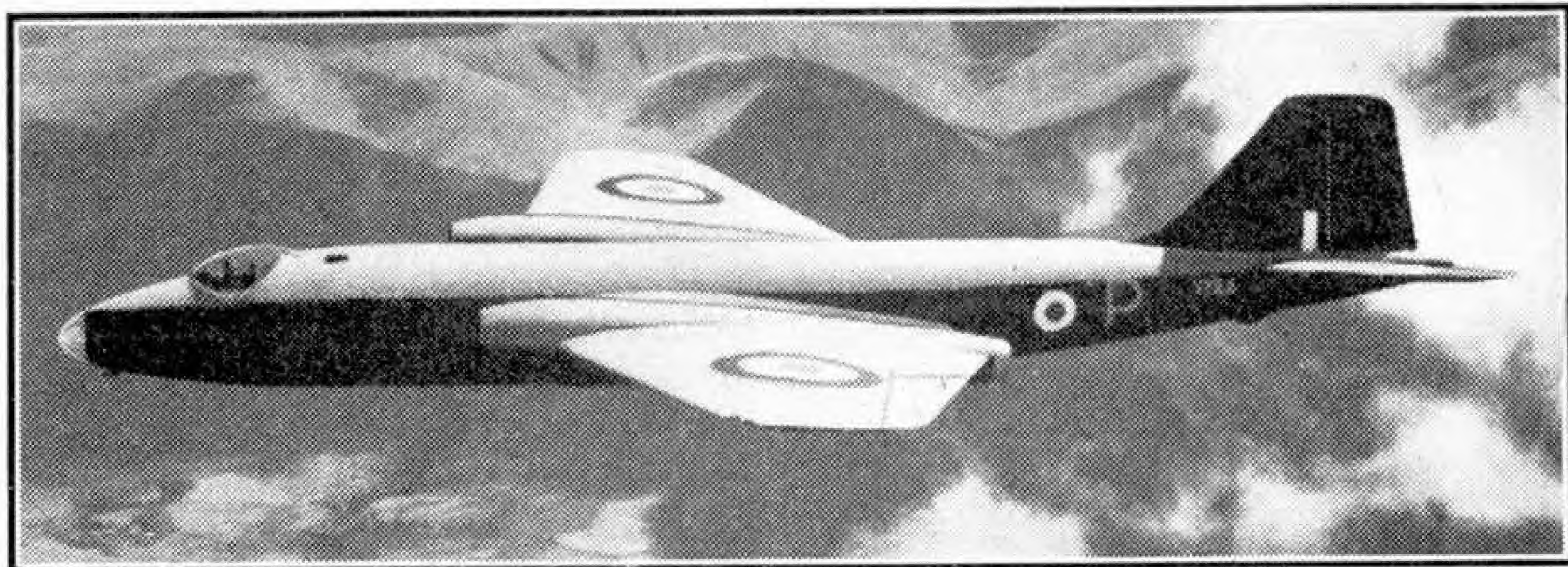
Feeding the baby. The illustrations to this article are by the author.

if care is taken to hold the camera perfectly steady at the moment of exposure. Another point to remember when photographing animals is that they have four legs, but are often represented in photographs as having only three, or sometimes, two, owing to taking the photograph without paying sufficient attention to the image shown in the viewfinder. These little blemishes are most annoying as they often spoil an otherwise good snap, and one can do little about it once the exposure has been made, so shoot carefully and you will be certain of better results.

Finally, try making a few snaps with the camera pointing towards the light, but not directly into the sun. This will give an interesting halo effect and cause the subject to stand out from the background, which is most pleasing. The exposure should be doubled for this kind of photograph.



Friends.



The "Canberra" Mk.2 jet bomber. Photograph by courtesy of English Electric Co. Ltd.

Air News

By John W. R. Taylor

"Canberra" Contracts

News that the English Electric "Canberra" jet bomber is to be built by Avro, Handley Page and Shorts, as well as in two factories of the English Electric group, is proof of its important role in Western Union defence plans, for seldom have so many major companies been concerned in the manufacture of a single aircraft type. Nor is its production to be confined to this country; preparations are already in hand to build it in Australia, and a "Canberra" has been sent to the United States to compete against the Martin XB-51, North American "Tornado" and North American AJ-1 for a substantial U.S.A.F. light bomber contract.

No performance figures for the "Canberra" may yet be quoted, but its demonstration at last year's S.B.A.C. Display left no doubt that it is in the "over 600 m.p.h." class, combining fighter-like performance with a highly satisfactory bomb load. The new "Canberra" Mk.2, illustrated above, differs from the earlier prototype in having a Perspex bomb-aiming window in its nose, but it is otherwise little different from the Mk.1. It is powered by two 7,000 lb. thrust Rolls-Royce "Avon" turbojets.

Dutch Naval Air Visit

No. 860 "Sea Fury" Squadron and No. 4 "Firefly" Squadron of the Royal Netherlands Navy, which are normally based on the R.N.N. aircraft carrier "*Karel Doorman*," have flown to Royal Naval Air Stations at St. Merryn, Cornwall, and Eglinton, Northern Ireland, respectively for a period of intensive training side-by-side with squadrons of the Royal Navy. After a period of shore training, it is intended that they shall embark on a British carrier taking part in the summer cruise of the Home Fleet.

High-Speed Photography

Specially-modified versions of the Lockheed "Shooting Star" jet fighter, in service with the U.S.A.F., are able to photograph up to 20,000 sq. miles of territory during a single 3 hr. mission, flying at 550 m.p.h. at an altitude of 35,000 ft.

Each of these RF-80s carries a set of Fairchild cameras in its nose, in place of the usual machine guns, arranged to film simultaneously ahead, vertically below and obliquely on both sides of its line of flight. They were designed originally for wartime photo-reconnaissance, but produced such excellent test results that they have since been in great demand for peacetime mapping and air survey projects.

Typical missions have been to assist civil authorities in planning the development of timber reserves, to locate sites for hydro-electric projects and to survey new road and rail routes, as well as straightforward photography for map-making. More unusual was a low-altitude photographic sortie that provided information for a wildfowl census conducted in a Californian game refuge.

Another Airship

A tiny airship, claimed to be the world's smallest, has completed its initial test flights near Rome. Its makers claim that it can carry four passengers at 56 m.p.h. on less petrol than a motor car. It is small enough to land on a house terrace, but sufficiently powerful to cross the lofty Apennine Mountains.

"Hastings" on Meteorological Work

Handley Page "Hastings" aircraft are replacing "Halifaxes" in the R.A.F. meteorological squadron at Aldergrove, Northern Ireland. Aircraft from this unit, which belongs to Coastal Command, make daily flights of 1,600 miles over the Atlantic to obtain information on cloud formation, temperature, pressure and humidity, which is of the greatest value to forecasters preparing the daily weather charts.

The "Hastings" are outwardly similar to the type used by Transport Command, but have been modified internally and equipped with a comprehensive range of meteorological instruments. Their more spacious layout and increased amenities will enable the meteorological air observers to work more accurately and with greater efficiency, while the higher performance of the "Hastings" will enable observations to be made over a wider range of distance and heights.

Flying Furniture Van

When two families living respectively in Melbourne, Australia, and Launceston, Tasmania, decided recently to exchange houses, they left their removal problems in the capable hands of Mr. Broughton Cornish, a Hobart furniture remover. He simply rang up Trans-Australia Airlines, who put a freight-carrying aircraft at his disposal, and both families were happily installed in their new homes within 36 hours.

Mr. Cornish has transported some £25,000 worth of household effects in this way in the past two or three years, in 45 consignments. The move referred to above was but one incident in a "private air lift" between Tasmania and the mainland which lasted several months.

* * * *

The new de Havilland "Venom" jet fighter is to be built under licence by the Italian Fiat, Macchi and Ambrosini companies. Its "Ghost" engine also will be built in Italy, by Fiat and Alfa Romeo.

New Engines for D.H. "Comet"

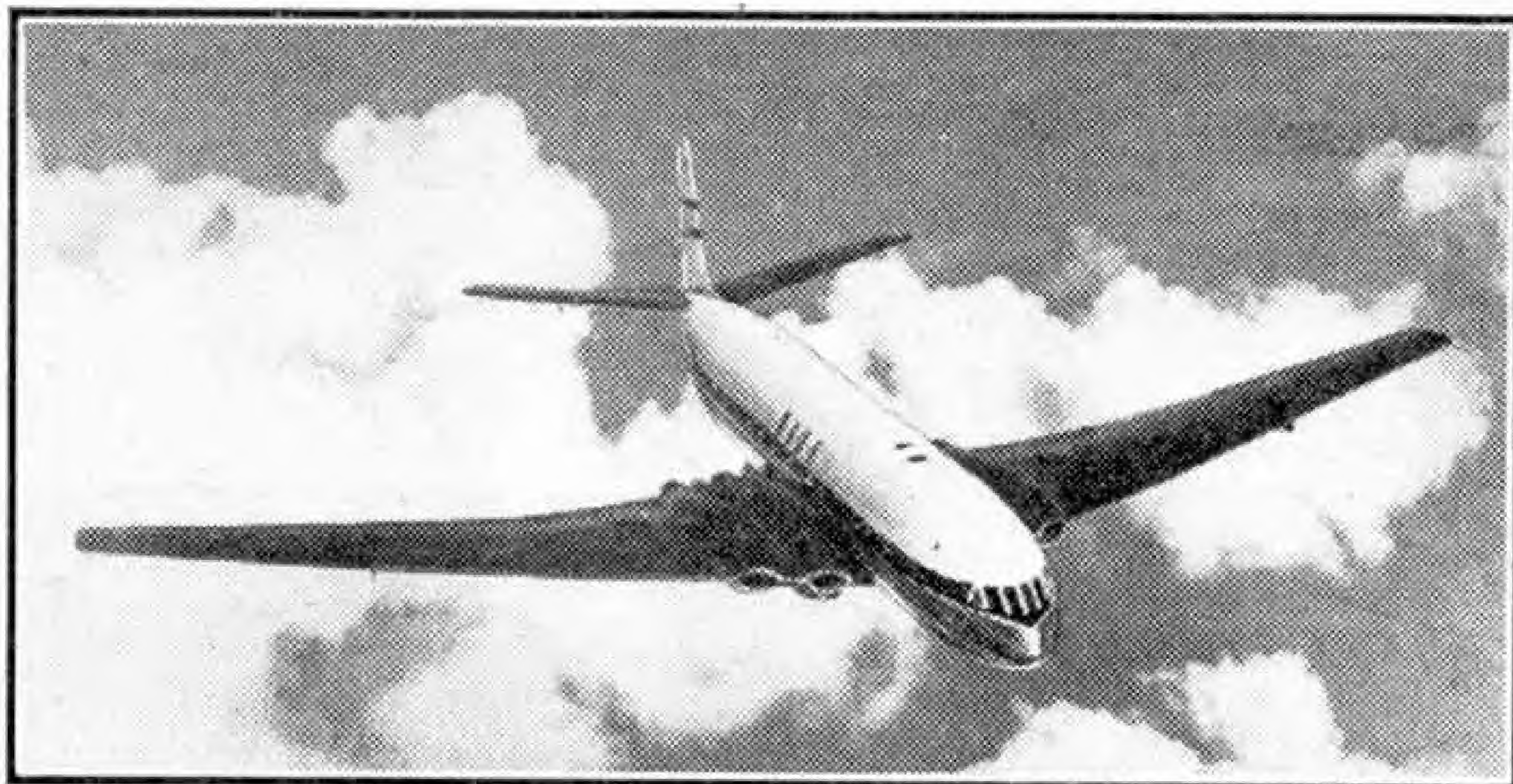
De Havillands have announced plans to produce a long-range version of their magnificent "Comet" jet air liner, fitted with either Rolls-Royce "Avon" or Armstrong Siddeley "Sapphire" turbojet engines.

The present "Ghost"-powered version of the "Comet," 14 of which are being built for B.O.A.C., was never intended for long-distance non-stop runs like that across the Atlantic. The substitution of more powerful axial-flow type engines will give both greater speed and longer range because of improved fuel consumption. Range may be extended further by carrying several hundred gallons of additional fuel in the wing leading edges. In this form, the "Comet" would probably take less than 9 hrs. to fly from London to New York against headwinds, compared with 18 hrs. for a present-day air liner. Flying East, it would cut the flying time from 12½ hrs. to less than seven.

B.O.A.C. plan to introduce the standard "Comets" experimentally on their routes early this Spring, and to put them on regular scheduled service to Cairo by September. Later, they will carry on through to South Africa and Australia; and, before the end of next year, will fly the New York-Nassau service.

Silver City Airways' Charter Flights

Besides operating the cross-Channel car ferry service, Silver City Airways cover as much as 40,000 miles a month on non-scheduled flights. Their Bristol "Freighters," fitted with 44 passenger seats, are proving very popular for carrying ships' crews to and from foreign ports, and five such flights were made in one month recently. On one trip, 40 seamen were taken to Antwerp; other flights took 35 to Gothenburg, 36 to Malta, 33 to Alexandria and 36 to Gibraltar. On most occasions the "Freighters"



D.H. "Comet," with new B.O.A.C. colour scheme. The white top reduces the cabin temperature in tropical areas. Photograph by courtesy of de Havilland Enterprise.

took out new crews to replace men who were to be brought home, and were thus sure of two-way loads.

Other charter operations undertaken by Silver City "Freighters" have included the transport of British exhibits to the Berlin Trade Fair, involving six flights, and the carriage of general cargo to Singapore for a Government department.

A New "Globemaster"

The new Douglas C-124A "Globemaster" II transport, illustrated on this page, is a development of the giant C-74 "Globemaster" which was used experimentally on the Berlin Air Lift. It uses the same wing, tail unit and engines as the earlier machine, but has a much bigger fuselage, fitted with quick-loading "clam-shell" doors in its nose through which heavy vehicles can be driven straight into the cargo hold. It is normally a single-decker, but can be converted quickly into a two-deck troop transport.

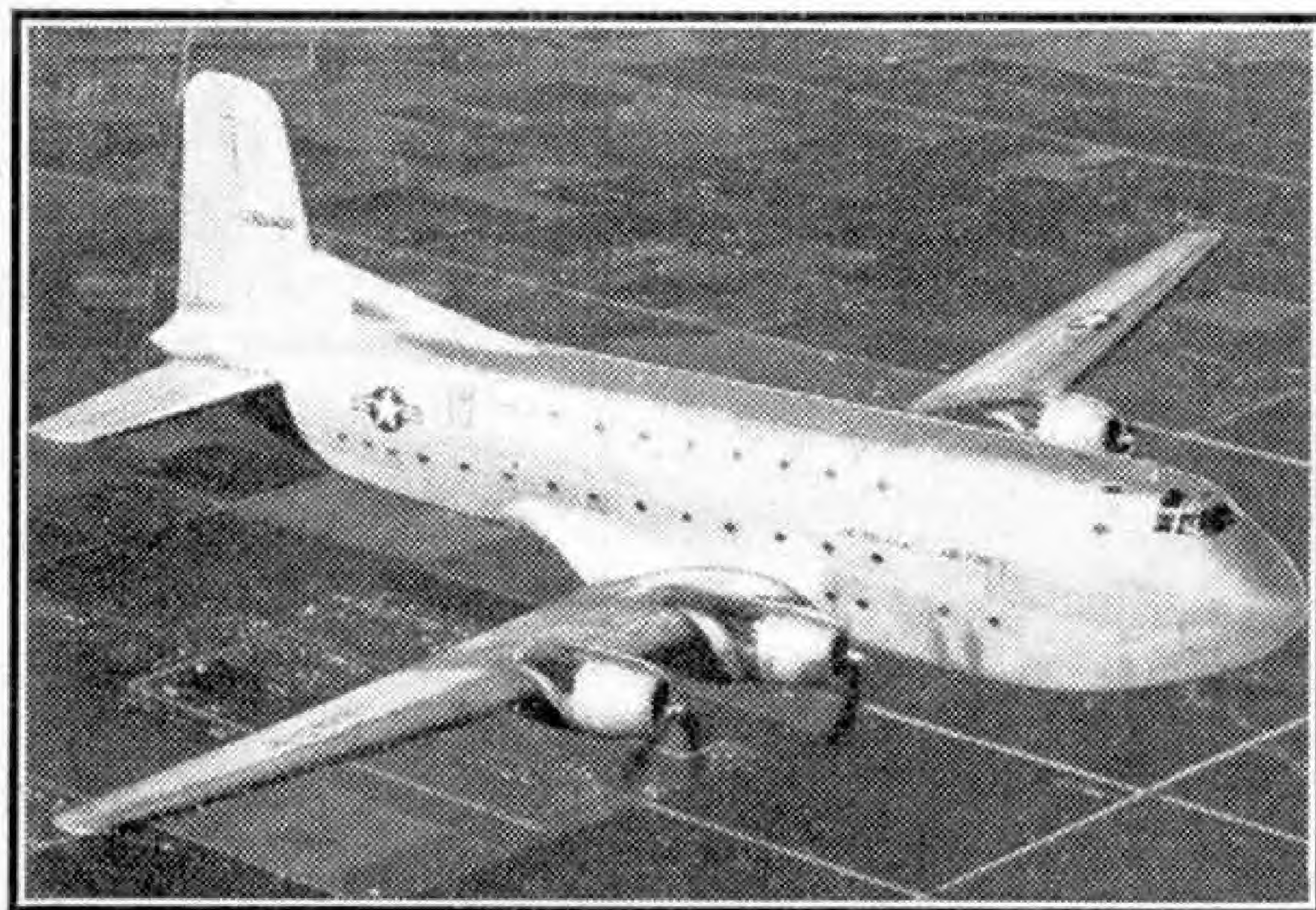
The 78-ton "Globemaster" II is the largest production transport ever to enter military service, and can carry over 22 tons of payload under normal operating conditions, made up of 200 troops or general cargo, tanks, field guns, giant cranes, bulldozers and fully-loaded lorries. It has a span of 173 ft. 3 in. and is powered at present by four 3,500 h.p. Pratt and Whitney R-4360 engines. But Douglas are building a YC-124B, powered by four 5,500 h.p. Pratt and Whitney YT34-P-1 propjets, which will carry over 30 tons of payload.

"Vampires" for R.N.Z.A.F.

The Royal New Zealand Air Force, which has ordered squadrons of de Havilland "Vampires," will be the twentieth air force to use jet fighters built in this country. Two-thirds of the major air forces of the world now use British jets; others are equipped with British "Mosquito," "Firefly," "Sea Fury" and "Spitfire" piston-engined aircraft.

K.L.M. Gift to Birmingham

A gift of 1,000 tulips has been sent by K.L.M. to Birmingham City Council in the hope that, when they flower in the Spring, they will add colour and beauty to the city during the early part of the Festival of Britain. The bulbs will be planted, appropriately, in the flower beds at Elmdon Airport.



The Douglas "Globemaster" II transport referred to on this page. Photograph by courtesy of Douglas Aircraft Company, U.S.A.

Among the Model-Builders

By "Spanner"

SERVO BRAKE FOR MODEL VEHICLES

For many years motor designers have aimed to simplify and improve the controls of their vehicles with the object of reducing the strain of driving at high speeds or with heavy loads, and many outstanding advances have been made. It was soon realised that the reduction of driving fatigue was a very important factor in increasing road safety, and the result is now to be seen in the power-assisted steering and gear-changes fitted to many modern heavy vehicles. One of the earliest and most generally adopted applications of power-assistance was in connection with the braking system, however, and assisted braking is now used in nearly all except the lightest vehicles.

One very efficient form of assisted braking consists of using the suction in the engine manifold to increase the effort applied to the foot pedal, and although this system cannot be reproduced exactly in Meccano, the mechanism shown in Fig. 2 operates on a similar principle. The mechanism is compact enough to be fitted to many Meccano chassis.

The only modification required to existing driving arrangements is to mount a Rod 1, driven at a fairly high speed by the Motor, across the chassis. A 1" Pulley 2 is fixed on the end of the Rod, and a second 1" Pulley 3 is free to turn on a Pivot Bolt fixed to the chassis. The brake pedal is a Crank extended by a 2½" Strip and loosely mounted on a Pivot Bolt, and it carries a linking arm 4 consisting of a 3" Strip extended by a 2" Slotted Strip. A second Crank 5 is fixed on a Rod also mounted across the chassis and which carries the brake operating levers. Crank 5 is linked by a

lock-nutted bolt to the slotted hole of the 2" Slotted Strip. A length of Cord is tied to the brake pedal at 6, passed round Pulleys 3 and 2, and then tied to Crank 5. It is important that the Cord should be slack when the brake is in the "off" position.

When the brake pedal is depressed the Cord is



Fig. 1. Meccano model-building helped to while away the time that Master Gory Silvester, Sydenham, S.E.26, was forced to spend in bed during a recent illness. Here we see Gory proudly displaying one of the many models that he built during his convalescence.

tightened round its Pulleys, and as Pulley 2 is driven constantly by the Motor it tends to drag the Cord and the Crank 5 to the right.

A SIMPLE STEERING MECHANISM

I have recently received from J. S. Smith, Cardington, Bedford, details of the interesting steering arrangement for model vehicles reproduced in Fig. 5. The mechanism is well designed and requires only a few simple parts, and an interesting feature is that the steering axis

of each wheel is directly in line with the point of contact of the tyre with the ground.

The axle beam shown in the sketch is assembled from two 5½" Strips connected by two 1½" x ½" Double Angle Strips, but of course this construction can be varied to suit the particular model or suspension system in which it is used. Each road wheel is formed by a 2" Motor Tyre pressed over a Boiler End, and it is carried on a stub axle formed by a Threaded Pin fixed in a Wheel Disc. The Wheel Disc is attached to a 1½" x ½" Double Angle Strip, and the assembly pivots about a 2" Rod passed through the lugs of the Double Angle Strip and the end holes of the axle beam. The road wheels are connected by a track rod formed by a Rod fitted at each end with an End

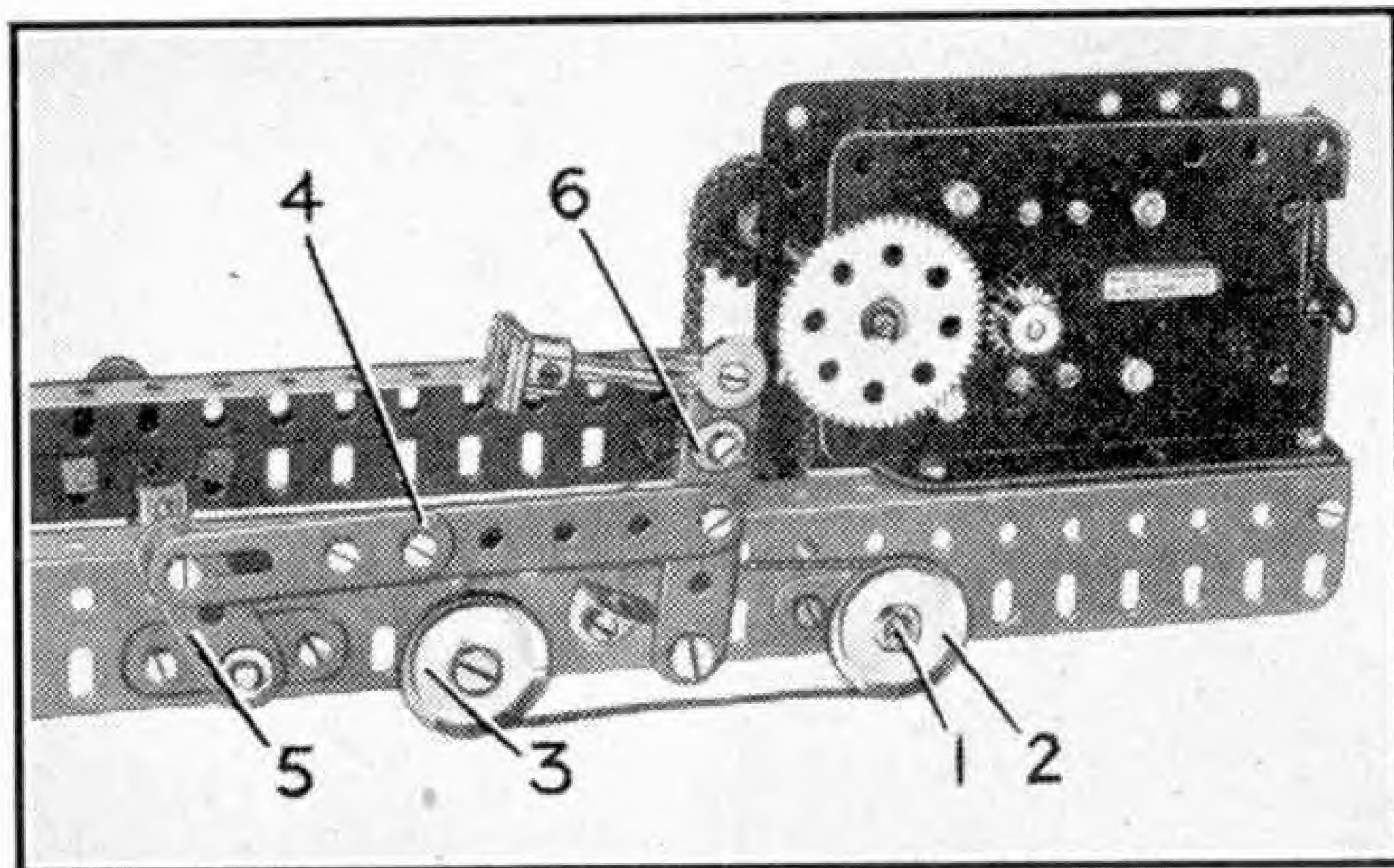
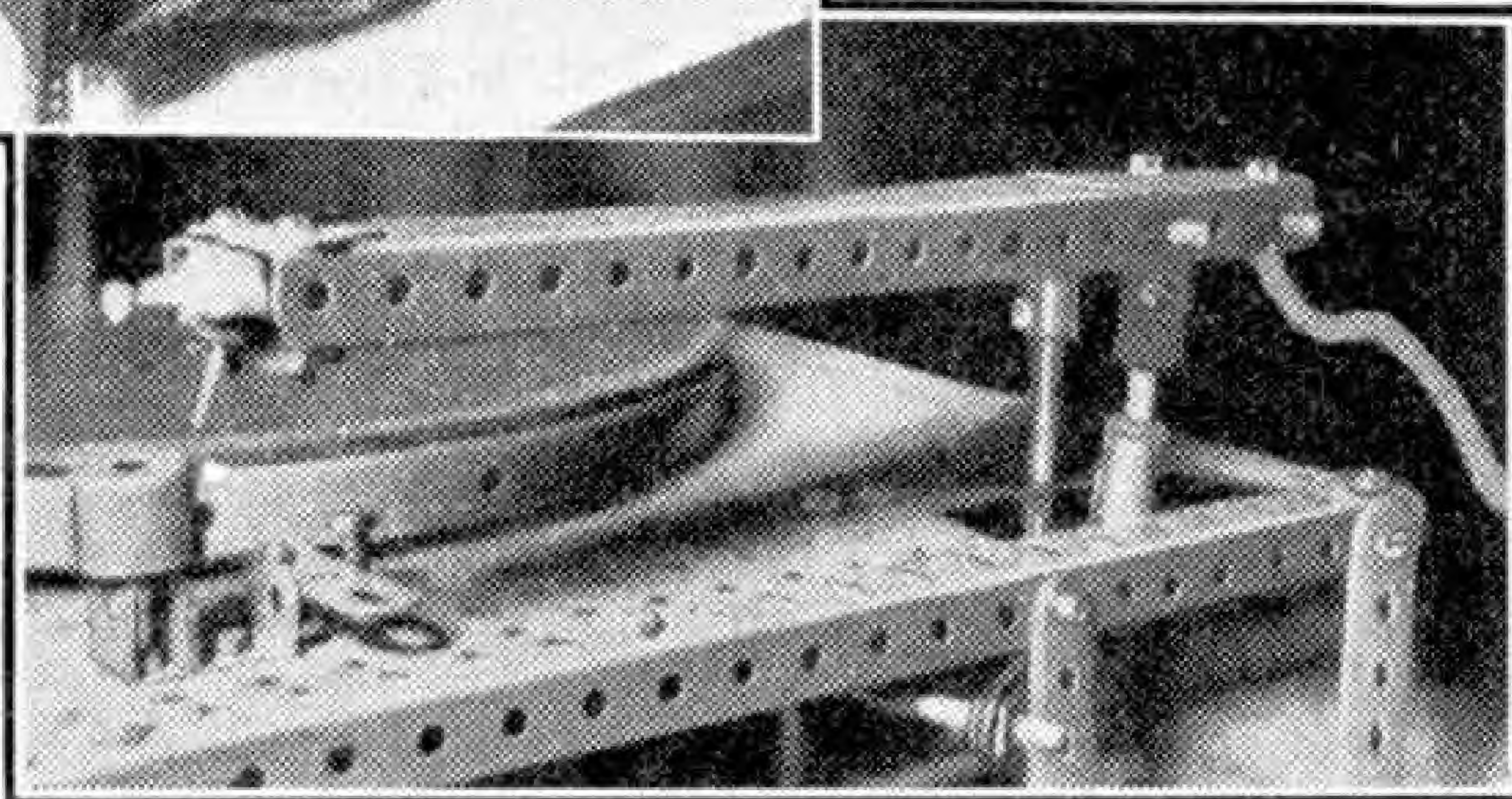


Fig. 2. The servo brake mechanism described on this page.



Figs. 3 and 4. An automatic record-changing electric gramophone. It was designed and built by A. M. Revilla, La Paz, Bolivia, and is made almost entirely from Meccano parts. On the right is a close-up view of the pick-up arm.



Bearing. The End Bearings are connected by lock-nutted bolts to Angle Brackets fixed to the Wheel Discs.

The steering arm is a $1\frac{1}{2}$ " Strip bolted to a 1" Triangular Plate that is bolted to a $1\frac{1}{2}$ " Angle Girder. The Angle Girder is connected to one of the Wheel Discs, and the $1\frac{1}{2}$ " Strip is connected by a Rod and two Rod and Strip Connectors to the drop arm. The latter is a Crank fixed on a Rod fitted with a $1\frac{1}{2}$ " Contrate that meshes with a Pinion on the lower end of the steering column. The arrangement of the gearing and steering linkage is shown clearly in the sketch, but it should be noted that the Contrate should be reversed so that it is on the opposite side of the Pinion when the mechanism is used in a model.

A MECCANO AUTO-CHANGE ELECTRIC GRAMOPHONE

One of the most enterprising model-building efforts that has come to my notice for some time is a remarkable automatic record-changing electric gramophone, which was designed and built by Alfonso Mier Revilla, La Paz, Bolivia. The machine is illustrated on this page, and with the exception of a few elements such as the pick-up needle and an electric circuit breaker, it is built entirely from Meccano parts. Its motive power is provided by two Motors, which drive all the intricate motions. A special feature of the machine is the auto-change

mechanism. This I understand is original in design, and is not imitative of any standard commercial mechanism. It is designed to deal with up to six 10-inch records, and a selective mechanism is incorporated to allow any record to be rejected at will. I think all Meccano model-builders will join with me in congratulating Sn. Revilla on a very interesting achievement, which represents a further very fine example of the flexibility and adaptability of the Meccano model-building system.

HOW TO USE DRIVING BELTS

Meccano Cord is often used as a driving belt, and for suitable light models a simple endless belt of Cord is very efficient. An ordinary reef knot is the most satisfactory method of joining the ends of the Cord. In larger and heavier models, however, it may be found that the Cord becomes slack after periods of continuous running and tends to slip. A simple method of overcoming this difficulty and maintaining the tension of the belt is to tie each end of the Cord to a Driving Band so that the Band is

stretched slightly when the belt is passed around the Pulleys. A little powdered resin sprinkled in the grooves of the Pulleys or rubbed on the Cord will also help considerably in reducing slip. When a deep grooved Pulley such as a 3" or a 2" Pulley is used a useful hint is to place a suitably sized Driving Band around the rim of the Pulley before putting the Cord in position. The Band will provide a non-slip surface for the belt to grip on.

In some models such as hammerhead and gantry cranes a Cord belt is required to traverse the carriage supporting the pulley block. In a large model the Cord is usually carried on a special winding drum, but in smaller models a simple belt of Cord is often passed round a Pulley. This arrangement may tend to slip under load, and it is a good plan to loop the Cord two or three times round the driving Pulley before tying the ends to the carriage.

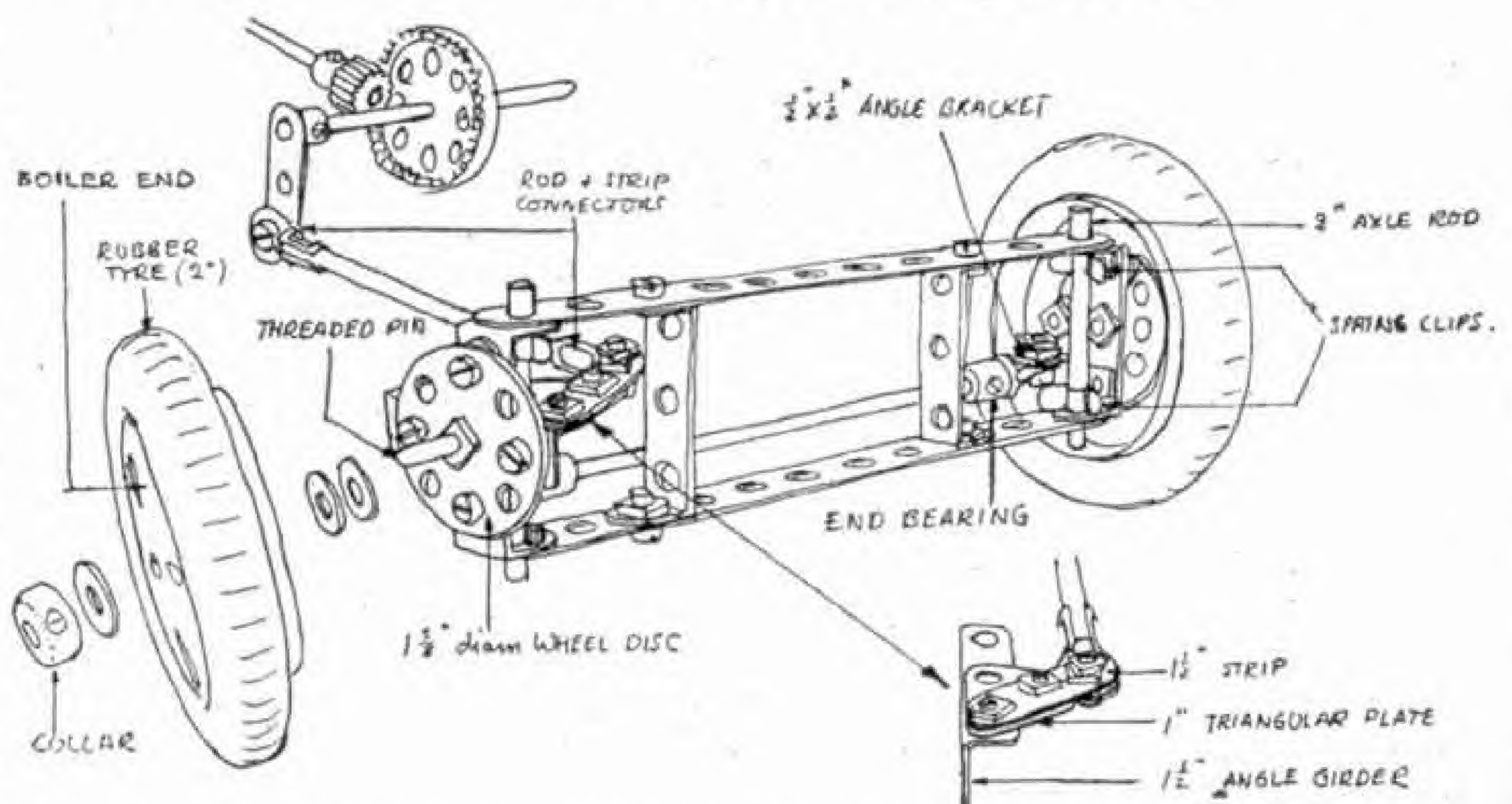


Fig. 5. A simple steering device for model vehicles suggested by J. S. Smith, Cardington.

Advanced Model-Builders' Page

Fidler's Block-Setting Gear

CONSTRUCTORS of large and intricate model cranes can add considerably to the interest of their work by the inclusion of specialised lifting tackle, adapted for handling particular types of loads. One type of crane that is very suitable for this is the giant block-setter, which has always been a first favourite among keen model-builders having a large Outfit at their disposal. These cranes are used in building and repairing harbour walls, breakwaters and piers, and they have to lift and place in position large blocks of concrete.

Sometimes the blocks are laid horizontally in the same way as the bricks of an ordinary wall, but in many cases a more complicated form of construction is required and the blocks are set at an angle, or as it is technically known, on an inclined bond. With this arrangement the breakwater or wall is rendered much more able to resist the assault of heavy storm waves than it is when the faces of the blocks are vertical.

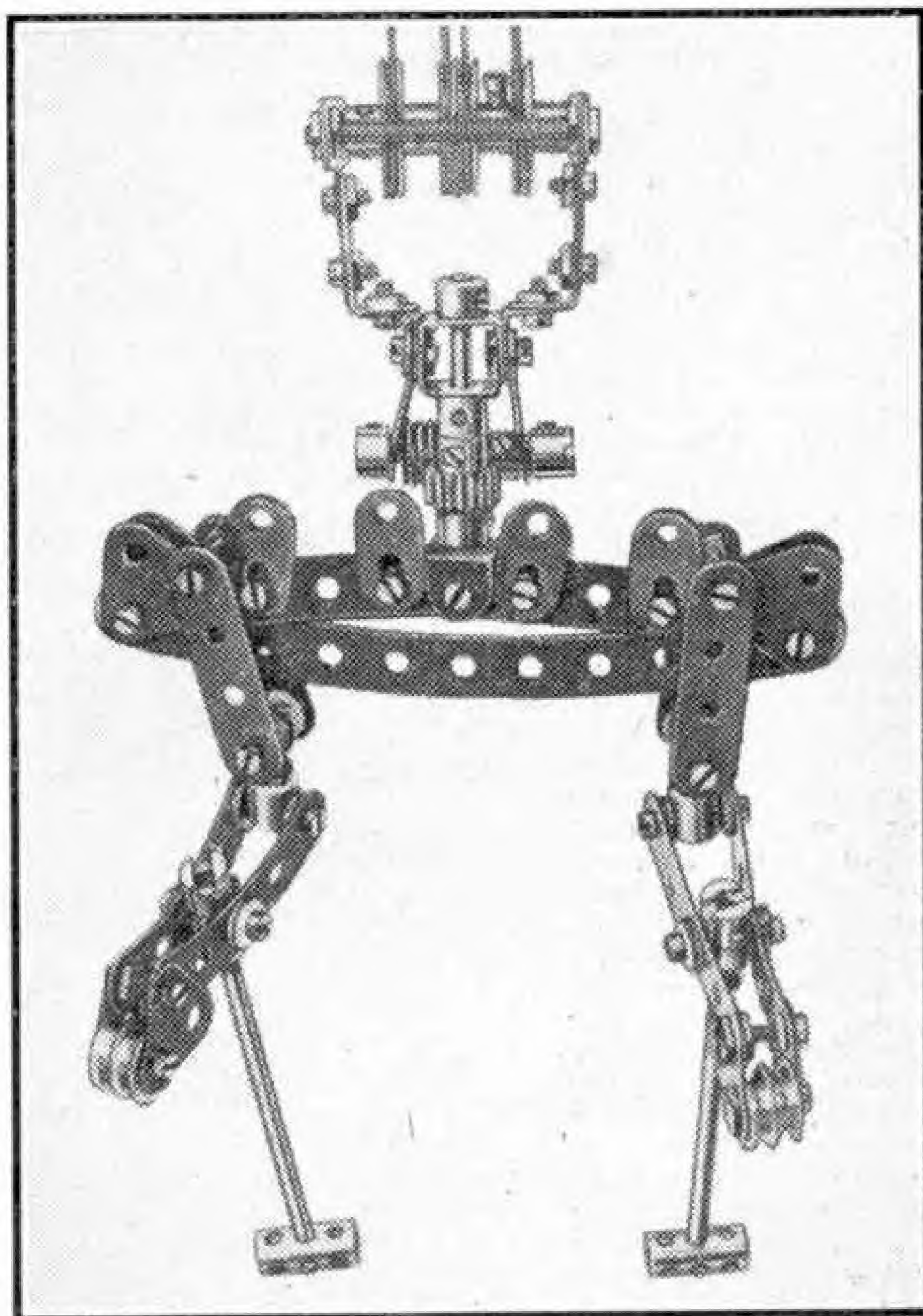
The problem of slinging and lifting the blocks for "angle" or "inclined" setting, presents some difficulty, however, for the blocks must be lowered to within an inch or less of their correct position, and the movements controlled within fine limits, often amid heavy seas and stormy weather. This difficulty can be overcome by means of an ingenious lifting tackle and tilting mechanism known as Fidler's patent block-setting gear, a Meccano model of which is illustrated on this page.

The actual mechanism consists of a massive beam hanging from a swivelling joint, the whole suspended by a special multi-sheaved pulley. The rotating movement of the beam on the swivel is controlled by a worm gear, which meshes with a pinion wheel on the vertical swivel bar.

A link hangs from the end of each arm of the beam, and these support steel cross-heads carrying rollers. From each of these cross-heads there hangs a long bar with a "T"-shaped end. Two perpendicular holes run completely through the concrete blocks, the holes being of sufficient width across one of their sections to take the T-shaped pieces at the ends of the bars.

The actual operation of lifting and placing a block is as follows. The multi-sheaved pulley of the crane with Fidler's gear fitted is lowered, and workmen guide the bars through the vertical holes in the concrete block. When these completely penetrate the full depth of the block, the bars are given a quarter turn, which throws the T-shaped ends out of register with the holes and thus prevents the rods being withdrawn. Just before the bars reach the bottom of the holes, the rollers on the steel cross-heads bear against the top surface of the block and roll across, altering the relative positions of the points of suspension and the bars.

The signal is then given to the crane-man to hoist, and the block is lifted at the exact angle at which it is to be set in position. The crane swivels round until the block is over its (Continued on page 142)



A Meccano version of Fidler's Block-setting Gear. This tackle is often used in building harbour walls and breakwaters from large concrete blocks.

Meccano Competitions

By "Spanner"

Cash Prizes for "M.M." Readers

"Winter" Model-Building Competition

In the February issue we gave details of the main model-building competition of the winter season, in which we are offering splendid cash prizes for models of any size and type built entirely from Meccano parts. The competition is open to readers living in

often forced to find novel ways and means of building up their structures and mechanisms. This therefore is a good time to look for suggestions that will help all.

The devices we have in mind are those suitable for inclusion in the "Among the Model-Builders" page of the Magazine, and we are offering cash prizes

for the best submitted to us by readers. Clutches, locks, automatic grabs for cranes, gear-boxes and reversing free wheel and brake mechanisms showing novelty in the use of parts, are typical suitable entries for this contest.

Entries should take the form of photographs or good drawings, with explanatory notes where necessary, and they should be addressed "April Suggestions Competition, Meccano Ltd., Binns Road, Liverpool 13." There will be two sections, Home and Overseas, and in each the prizes will be £2/2/-, £1/1/- and 10/6. Closing dates: Home, 30th April,

Overseas, 30th July.

Photographs or drawings of unsuccessful contributions will be returned to the sender only when a stamped addressed envelope is enclosed for that purpose. It should be noted, however, that photographs or drawings of prize-winning suggestions become the property of Meccano Ltd.

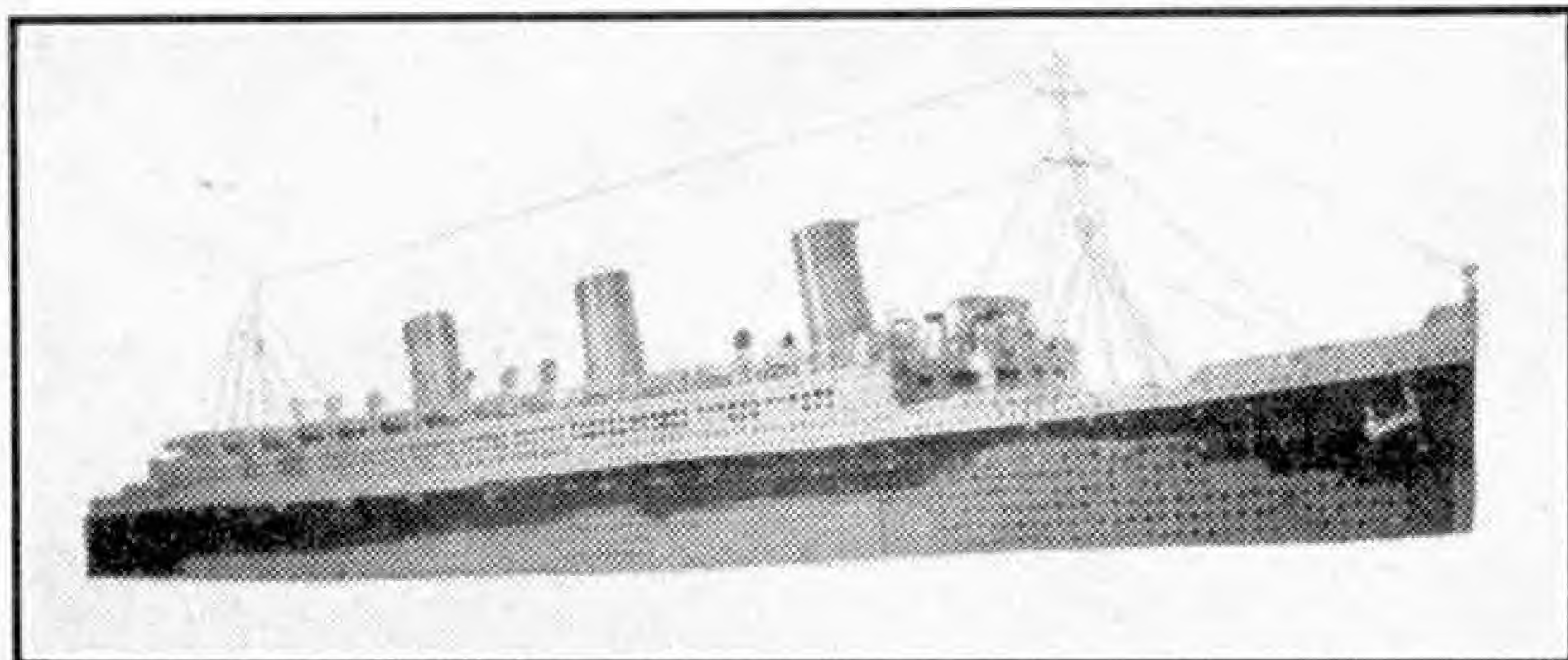


Fig. 1. A graceful model of a giant ocean liner built by P. Giese, Buenos Aires. It was awarded First Prize in an "M.M." Competition.

any part of the world, and as there is still time to send in entries we are repeating the details of the contest for the benefit of those readers who did not see the previous announcement.

Simple cranes built with small Outfits, giant locomotives constructed from the largest ones, bridges, motor vehicles and machines of all kinds are all eligible. Every model-builder should join in this grand contest, even if his Outfit is a small one and he is a beginner, for the judges will take these points into consideration in making their awards.

Preparing an entry for this contest is very easy. The model itself is not required, all that should be sent being a photograph or drawing, with any notes required to explain special constructional features. The competitor must write his name, address and age on the back of each photograph or drawing, and his entry should be forwarded to "Winter Model-Building Contest, Meccano Ltd., Binns Road, Liverpool 13."

The competition is open to readers of all ages and is divided into two Sections; "A," for competitors in the British Isles, and "B," for Overseas competitors.

The prizes to be awarded to the builders of the most interesting models received in each Section are as follows: First, Cheque for £3/3/-; Second, Cheque for £2/2/-; Third, Cheque for £1/1/-. There will be also five further prizes each consisting of a Postal Order for 10/6, and five of Postal Orders for 5/-.

A number of Certificates of Merit also will be awarded to competitors whose models fall just short of prize-winning standard.

Section A will close for entries on 31st March, but Section B will remain open until 31st May.

Handsome Prizes for Suggestions

One of the greatest advantages of the Meccano system is its flexibility. On the one hand its ingeniously designed parts can readily be built up into structures of every possible kind, and on the other each part itself is capable of many different applications. Model-builders have always showed great ingenuity in adapting the parts to different purposes, and this is particularly notable nowadays, when it is not always easy to obtain new parts and model-builders are



Fig. 2. A motor-driven lawn mower, by G. Mackenzie, Elgin, a prize-winner in an "M.M." Competition.

New Meccano Model

An Electrically Operated Mobile Crane

OUR new model this month is the attractive mobile crane illustrated in Fig. 1. The model is built with the parts included in Outfit No. 7, and the hoisting and luffing movements are operated from an E20R Electric Motor fitted in the swivelling cabin.

The travelling base should be assembled first, and is made by bolting three $3\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plates 1 and 2 to two compound $8\frac{1}{2}"$ strips made from $5\frac{1}{2}"$ Strips overlapped. The sides of the base are $5\frac{1}{2}" \times 2\frac{1}{2}"$ and $4\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plates overlapped, and they are braced by $2\frac{1}{2}"$ Strips and compound $8\frac{1}{2}"$ strips. The sides are connected at each end by a $3\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip, and the ends are filled in by $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plates and U-section Curved Plates. The Curved Plates are attached to Double Brackets fixed to the Double Angle Strips.

The wheel covers are made from $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plates curved to shape and attached to the base by Obtuse Angle Brackets. Two Formed Slotted Strips 3 are bolted to each $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate, and the Slotted Strips on each side are connected by 3" and $2\frac{1}{2}"$ Strips attached by Angle Brackets. A $5\frac{1}{2}"$ Strip 4 is fixed to Fishplates, and the wheel covers at each end are connected by a

$5\frac{1}{2}"$ Strip 5. A $3\frac{1}{2}"$ Pulley 6 is attached to the Flanged Plate 1 by $\frac{3}{8}"$ Bolts.

The cabin is assembled on a platform formed by two $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plates 7 and 8 connected at each side by a $3\frac{1}{2}"$ Strip overlapping a $5\frac{1}{2}"$ Strip by two holes. The sides consist of $3\frac{1}{2}"$ Strips 9 and compound strips 10 connected at their upper ends by a $5\frac{1}{2}"$ Strip extended by a $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 11. Each side is completed by a $5\frac{1}{2}" \times 2\frac{1}{2}"$ and a $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate. These are bolted at one end to the Strips 9, and at the other end they are clamped between strip 10 and two Angle Brackets fixed to the strip. The front of the cabin consists of a $5\frac{1}{2}" \times 2\frac{1}{2}"$ and a $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate bolted to the Flanged Plate 7 and attached to the sides by Angle Brackets.

The driver's turret is made by attaching two $2\frac{1}{2}"$

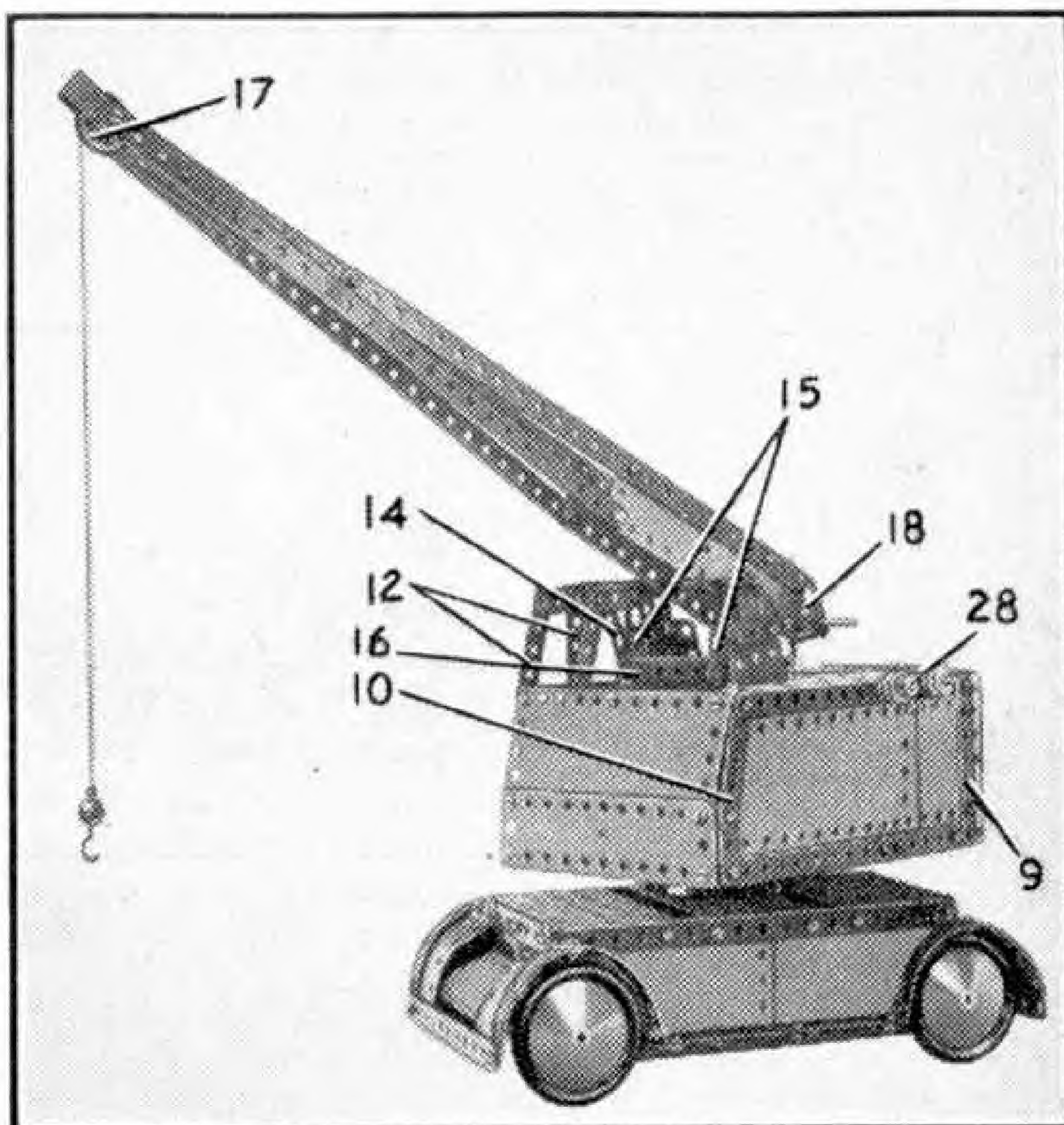


Fig. 1. A modern mobile crane that can be built from Outfit No. 7.

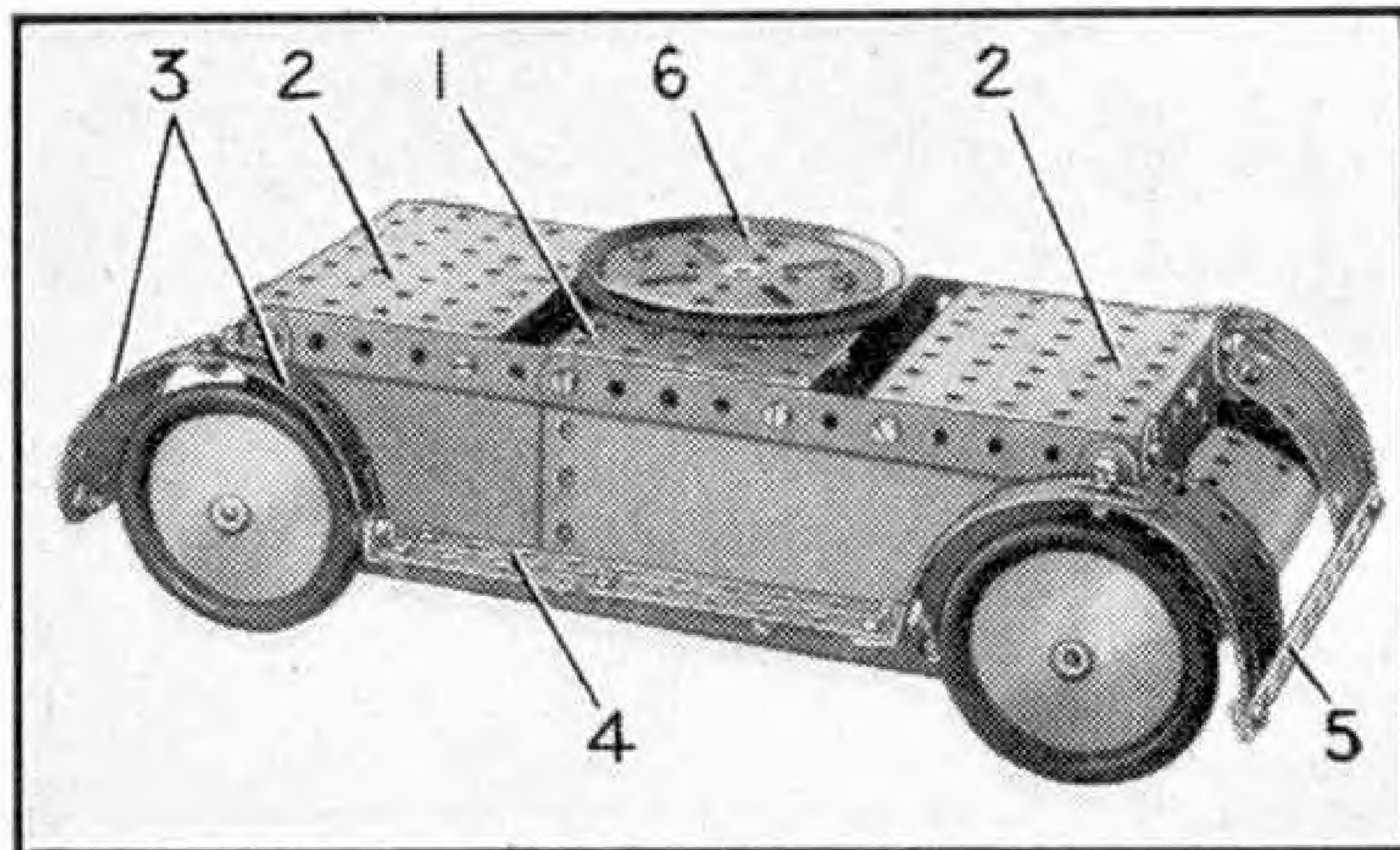


Fig. 2. The undercarriage of the mobile crane.

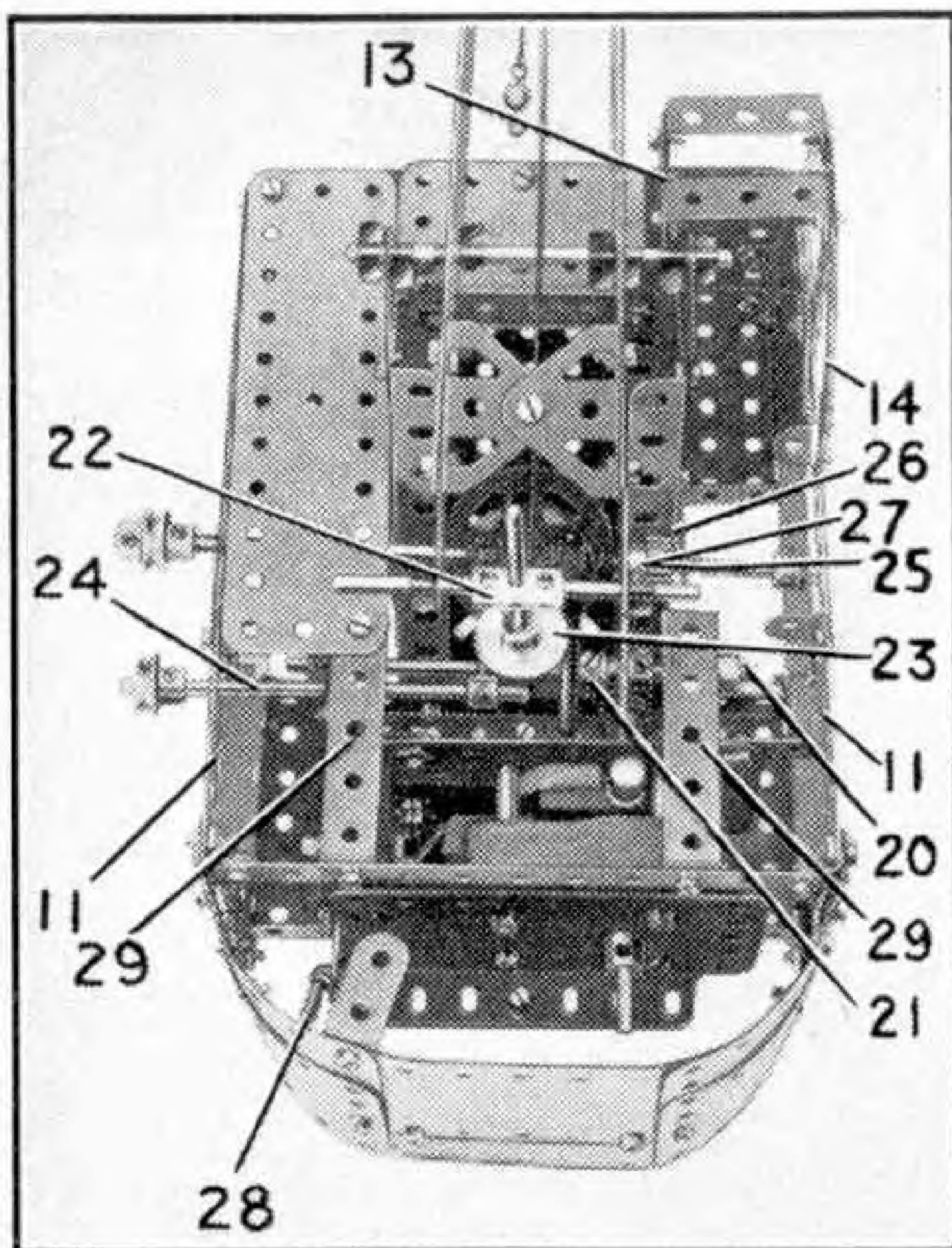


Fig. 3. The arrangement of the driving Motor and the hoisting and slewing movements.

Strips 12 to one side, and connecting their upper ends by a $1\frac{1}{2}$ " Strip. Two $1\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strips form the top of the turret, and these are linked by a $1\frac{1}{2}$ " Strip 13. A $2\frac{1}{2}$ " stepped Curved Strip 14 is fixed to the turret and is connected to the side of the cabin by a Fishplate.

The bearings for the jib are provided by Flat Trunnions bolted to Flanged Sector Plates 15. These are bolted by their flanges to the Plate 7, and are connected by Fishplates to the Plate 8. The Flanged Sector Plates are connected by a $2\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strip 16.

The jib is made from six $12\frac{1}{2}$ " Strips and two $5\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plates. Four of the Strips are overlapped in pairs to form two compound $17\frac{1}{2}$ " strips, and they are bolted to the upper edges of the Flexible Plates. The remaining $12\frac{1}{2}$ " Strips are bolted between the jib head and the lower edges of the Flexible Plates. The sides of the jib are connected by two Trunnions and by a Stepped Bent Strip at the jib

head. A 1" loose Pulley 17 is free to turn on the shanks of the bolts used to fix the Stepped Bent Strip in position, and two Flat Trunnions 18 are bolted at the lower end of the jib.

The E20R Electric Motor is attached to Flanged Plate 8 by two $\frac{1}{2}$ " Reversed Angle Brackets and by a 1" \times 1" Angle Bracket 19. A Worm fixed on the Motor shaft meshes with a 57-tooth Gear on a Rod 20 mounted in 1" \times 1" Angle Brackets bolted to the Motor side-plate. The Rod is held in position by Collars, and it carries a 1" Pulley 21 fitted with a Rubber Ring.

The jib is luffed by the action of a Screwed Rod threaded into the centre tapped hole of a Coupling 22, which is fitted with two $1\frac{1}{2}$ " Rods passed through the Flat Trunnions 18. A $\frac{3}{4}$ " Flanged Wheel 23 is fixed on the Screwed Rod, which is free to turn in a small Fork Piece but is prevented from sliding in the boss of the Fork Piece by lock-nuts. The lugs of the Fork Piece are passed over Rod 20, and the Flanged Wheel 23 is arranged so that it can be pressed against the Rubber Ring on Pulley 21 to form a friction drive. The drive is engaged by means of a Rod 24, mounted in the side of the cabin and in a Fishplate bolted to one of the 1" \times 1" Angle Brackets forming the bearings for Rod 20. A Collar fitted with a $\frac{1}{2}$ " Bolt is fixed on Rod 24, and the Bolt engages the lugs of the small Fork Piece used as the lower bearing for the Screwed Rod.

The hoisting movement is operated by a length of Cord fastened (Continued on page 142)

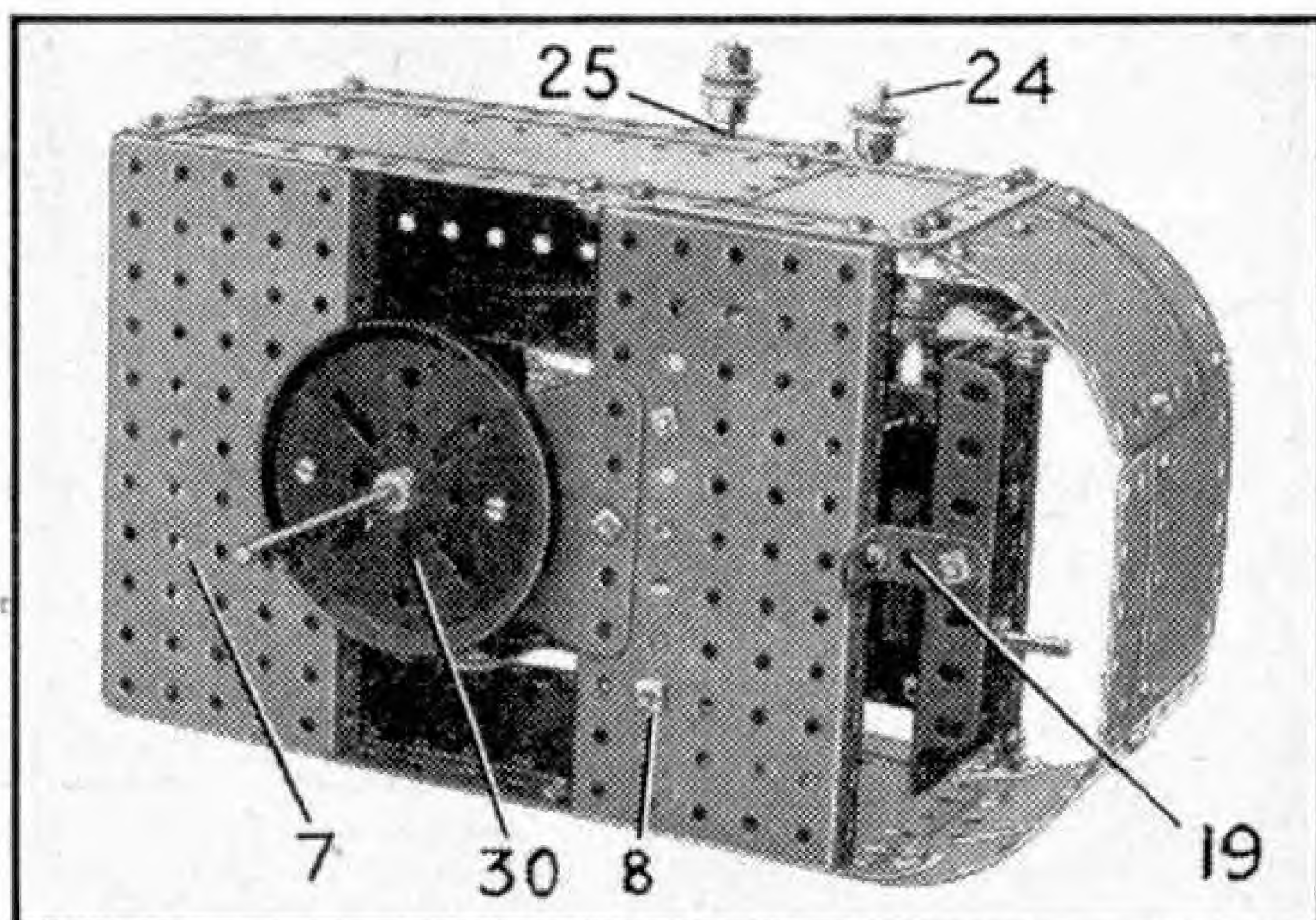


Fig. 4. An underview of the superstructure showing the upper half of the bearing unit.



Club and Branch News



WITH THE SECRETARY

CLUB SUBSCRIPTIONS

Even in small Clubs it is usual to arrange for a small subscription from members in order to cover expenses. Subscriptions mount up surprisingly when a Club is large, but in all cases it is advisable to keep very careful account of them, and indeed of all money belonging to a Club or Branch. A Treasurer should always be appointed, his duties being to collect subscriptions and to enter them in his records, and to make payments that have been authorised by the Committee. The accounts should be made up once a month, and a copy should be exhibited in the Club or Branch Room, so that all members can see exactly what is being done.

It is particularly important that care should be taken when a Club grows and begins to hold Exhibitions and other functions that are sources of extra revenue, and the accounts should show how much is realised in this manner, or by way of donations from friends. On the other side are expenses, which should be carefully considered by the Committee, and the monthly balance sheet should show exactly how much has been spent and what has been bought with it. The final step should be to have the balance sheet signed and approved by the Leader or Chairman as well as the Treasurer.

It is better to be over particular in regard to the money affairs of a Club or Branch. Any carelessness in this respect may lead to difficulties of various kinds.

START A SAVINGS SCHEME

We are now approaching the time of the year when excursions of various kinds are arranged, and here financial arrangements require careful consideration. Members may be left to provide train or bus fares for any lengthy excursions that may be undertaken during the outdoor months, but I always think it much better to start a savings system early, so that any particular event will not be too great a drain on the pockets of members when the time for paying for it arrives.

The plan is very simple. Each member pays in a small amount a week, perhaps 3d. or 6d., and all contributions are entered by the Treasurer in a special record, which should show at any time exactly what each member has in reserve. Then members can draw upon this savings fund as the need arises. It is surprising how easily financial requirements are met when this simple plan is followed.

RECENTLY INCORPORATED BRANCHES

529—INGLEDEW COLLEGE—*Secretary:* M. J. Fenwick, 8, Sandhill Drive, Alwoodley, Leeds.

530—NESSBANK—*Secretary:* Ian Hay, Lea Rig, Drummond Crescent, Inverness.

531—RAMSEY C. P. SCHOOL—*Secretary:* Peter Haddon, 2, Newtown Road, Ramsey, Hunts.

PROPOSED BRANCH

C. PARKER, 45, King George Avenue, Bridgwater, Somerset.

CLUB NOTES

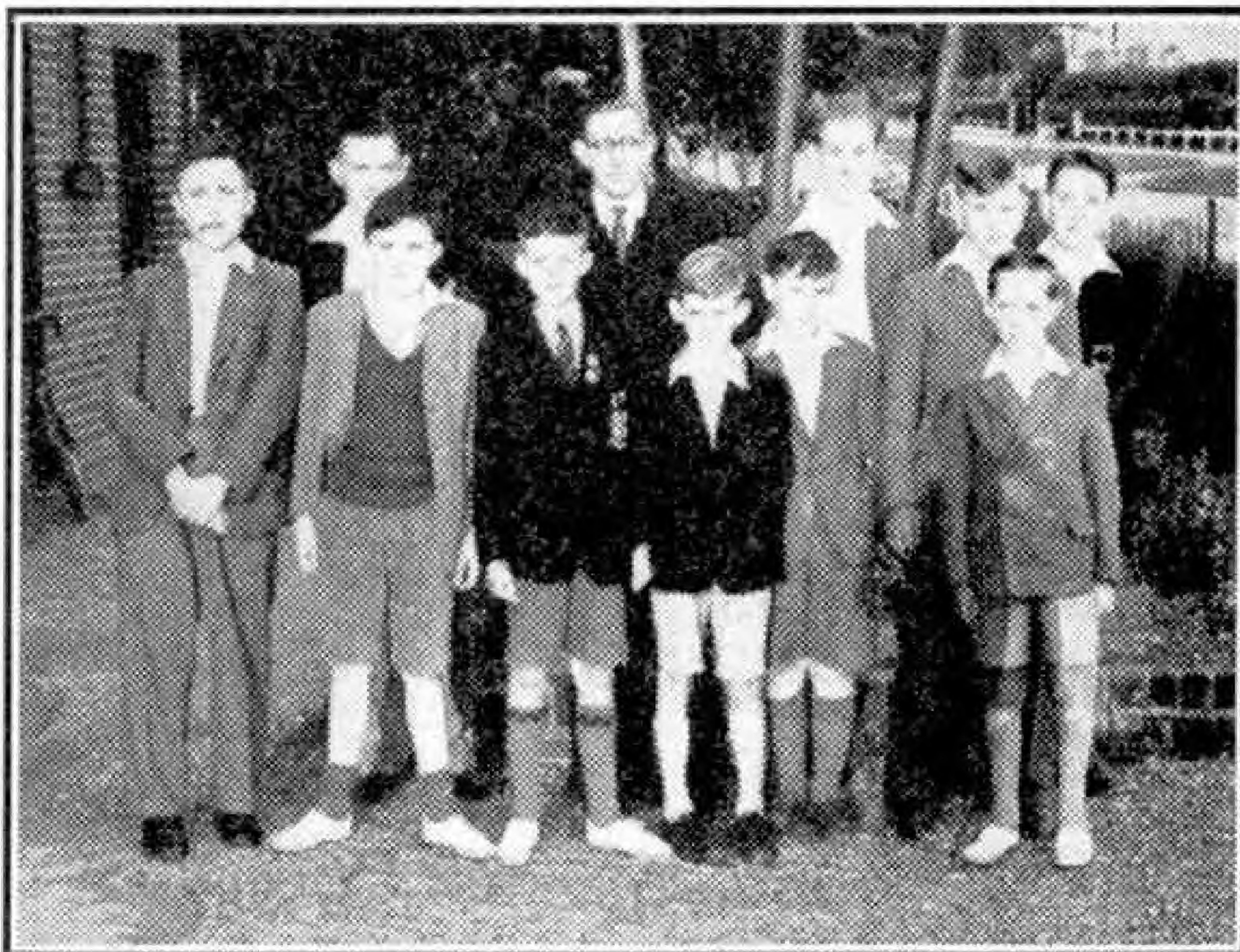
BELGRAVE UNION (LEICESTER) M.C.—A Cabinet for Meccano Parts has been constructed. The Parts themselves were catalogued before insertion in the places provided for them. The construction of boards to carry the Club's Hornby Railway has been continued, and the rails have now been laid and tested. Club roll: 38. *Secretary:* C. G. Smith, 20, Aveford Road, Leicester.

HORNSEA M.C.—Special evenings have been devoted to Model-building and a large model of the Forth Bridge has been started. Members have given Talks on animals, modern machinery and other subjects. A specially interesting Talk on "Ships," with pictures, was given by the Secretary. Films have also been shown and a Mock Council Meeting has been held. Club roll: 9. *Secretary:* R. Harris, Ty-Olaf, Victoria Gardens, Hornsea.

MILE END (PORTSMOUTH) M.C.—Competitions have brought good displays of models built by members. More Meccano Parts have been obtained and a "Festival of Meccano" Exhibition is planned for April. A splendid Christmas Party was enjoyed by all members. A Mock Trial was a feature of this, one member being accused of dropping Bolts and Nuts on the floor. Club roll: 30. *Secretary:* Mr. A. J. Nicholson, 213, Sultan Road, Buckland, Portsmouth.

AUSTRALIA

MAYLANDS (PERTH) M.C.—Projects for the Factions Exhibition included a Sugar Refinery, a Harbour and a Clover Leaf Road Junction. In each case the layout was filled with excellent models. A work bench and a small lathe have been installed for general Club work. The outdoor season is being greatly enjoyed with Cycle Runs, Bus Trips and Visits. Club roll: 37. *Leader:* Mr. V. Malmgreen, 16, Kennedy Street, Maylands, Perth, Western Australia.



Members of the Norbury M.C., with Mr. F. L. Bingen, formerly Leader of the Maastricht (Holland) M.C. This long established Club, President, Mr. W. J. Wyse, B.Sc., Leader, Mr. C. B. Chapman, has a splendid record of Meccano Model-building and other activities. A notable feature is the close friendship between the Club and the Maastricht M.C. Members of the two organisations have exchanged visits.

Rail Crossings in the Hornby System

THERE is a peculiar fascination about track crossings either in real or in miniature railway practice, perhaps because they allow two tracks to cross another

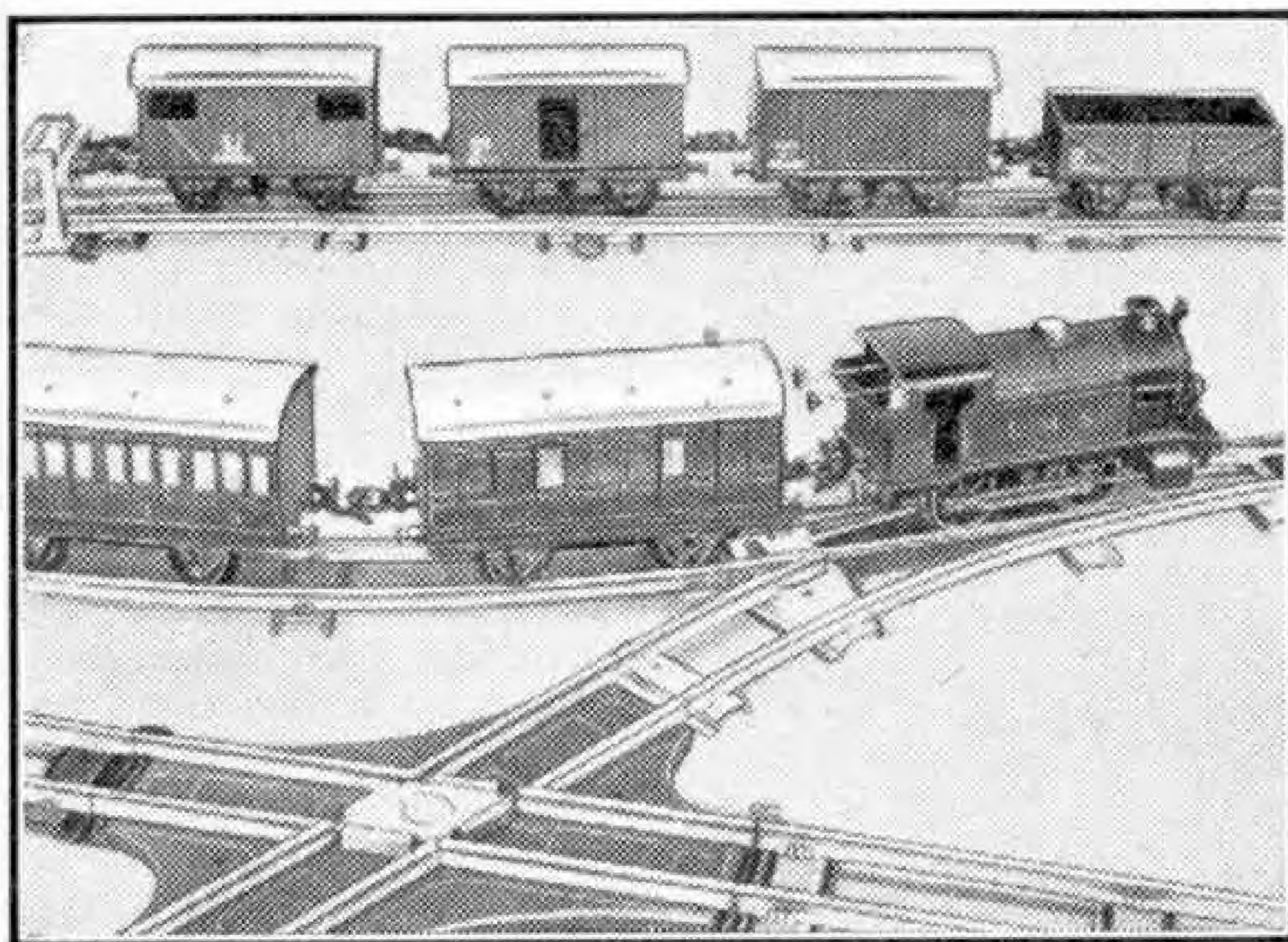
a 2 ft. radius example with the Acute Angle Crossing forms the layout illustration on this page. This provides a continuous track, the train passing over one route at the crossing and then over the other while on its journey. Unlike points a crossing does not provide a choice of routes that can be altered, but it does offer more entertaining running than a plain circle or oval.

A similar layout to that illustrated can be made up of 1ft. radius components and the rails then required are simply 10 Curved Rails A1, and the Acute Angle Crossing CA1.

The Right Angle Crossing is not used so much, perhaps, as the Acute Angle one because layouts in which it is included require a considerable amount of space and the Gauge 0 railway owner has little enough to spare nowadays. "Figure-eights"

and other variations can be made up with Right Angle Crossings with 2 ft. and 1 ft. radius components.

Suggestions for the use of crossings of both types will be found in the Hornby Gauge 0 Rail layouts booklet but the keen Hornby Train owner will always make up variations to suit his own

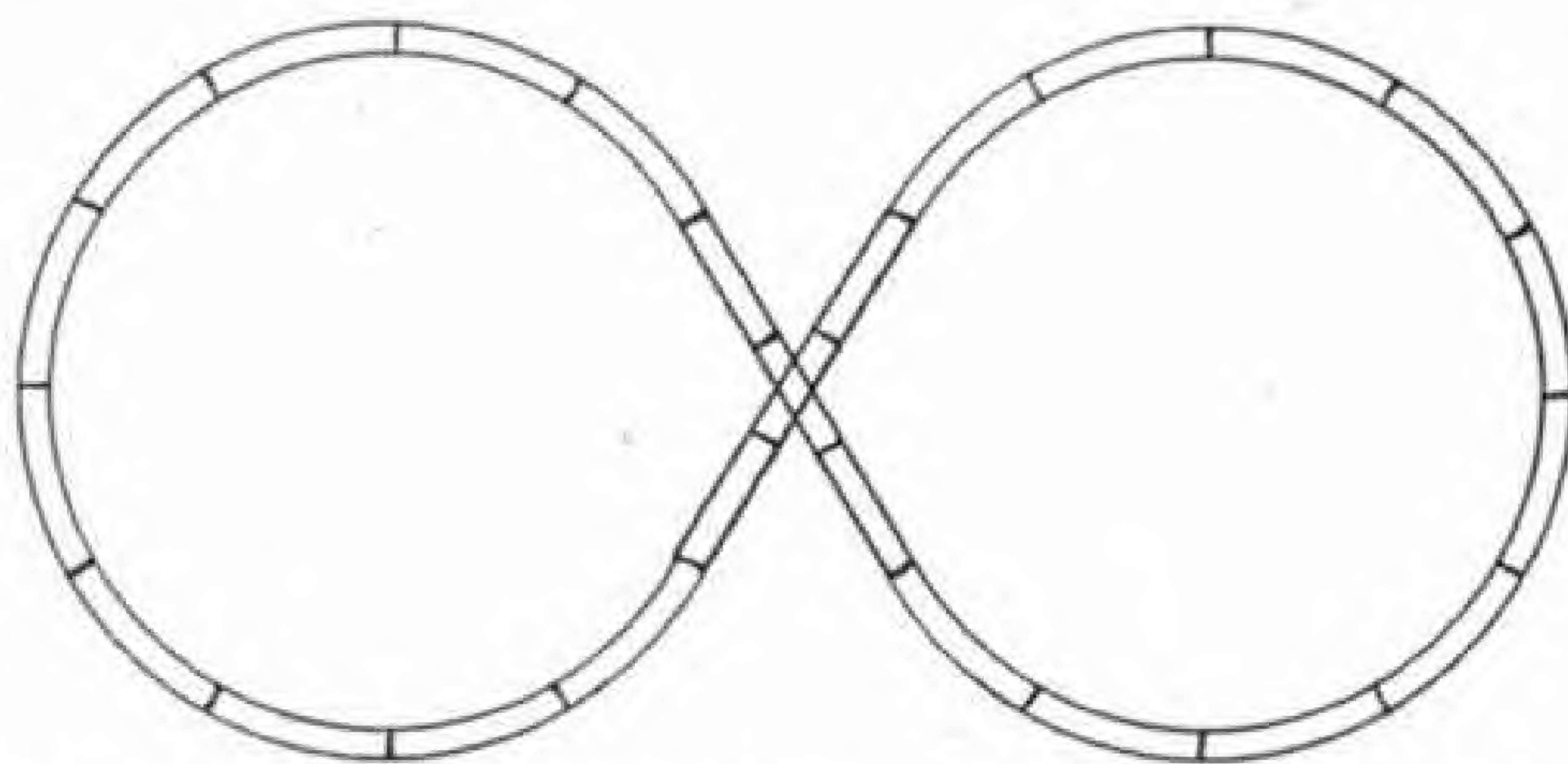


The Hornby Acute Angle Crossing (CA2) here forms part of a junction layout. Interesting schemes of this kind are possible where there is plenty of space.

on the level and yet remain independent. The familiar diamond crossing of the full size permanent way is represented in the Hornby System by the Acute Angle Crossing, a useful unit that is made in two sizes. One, known as CA2, is for the standard 2 ft. radius layouts, and the other, known as CA1, is for 1 ft. radius tracks. The difference between the two crossings is one of length only, the crossing angle being the same for each.

In addition to the Acute Angle Crossing there is a Right Angle Crossing in the Hornby System. The name of this is sufficient clue to its type, the two tracks crossing one another at right angles, or at an angle of 90 degrees. The Right Angle Crossing is made for 2 ft. radius systems (CR2) and there is a similar one for 1 ft. radius layouts, (CR1). Both types of Crossings for either radius make possible, with some additional rails, the expansion of the plain circle or oval with which most miniature railways begin into something more interesting.

The first choice of the young railway owner is usually a layout of the type generally known as the "figure-eight" and



A "figure-eight" layout made up of 2 ft. radius components. Rails required: 20 Curved Rails A2, 4 Straight Rails B1, 1 Acute Angle Crossing CA2.

particular ideas. The junction layout shown in the upper picture is an interesting example of this sort of thing.

There is no Crossing, either Acute Angle or Right Angle, for the 9 in. radius track of the .MO trains.

Mixed Traffic in Hornby-Dublo

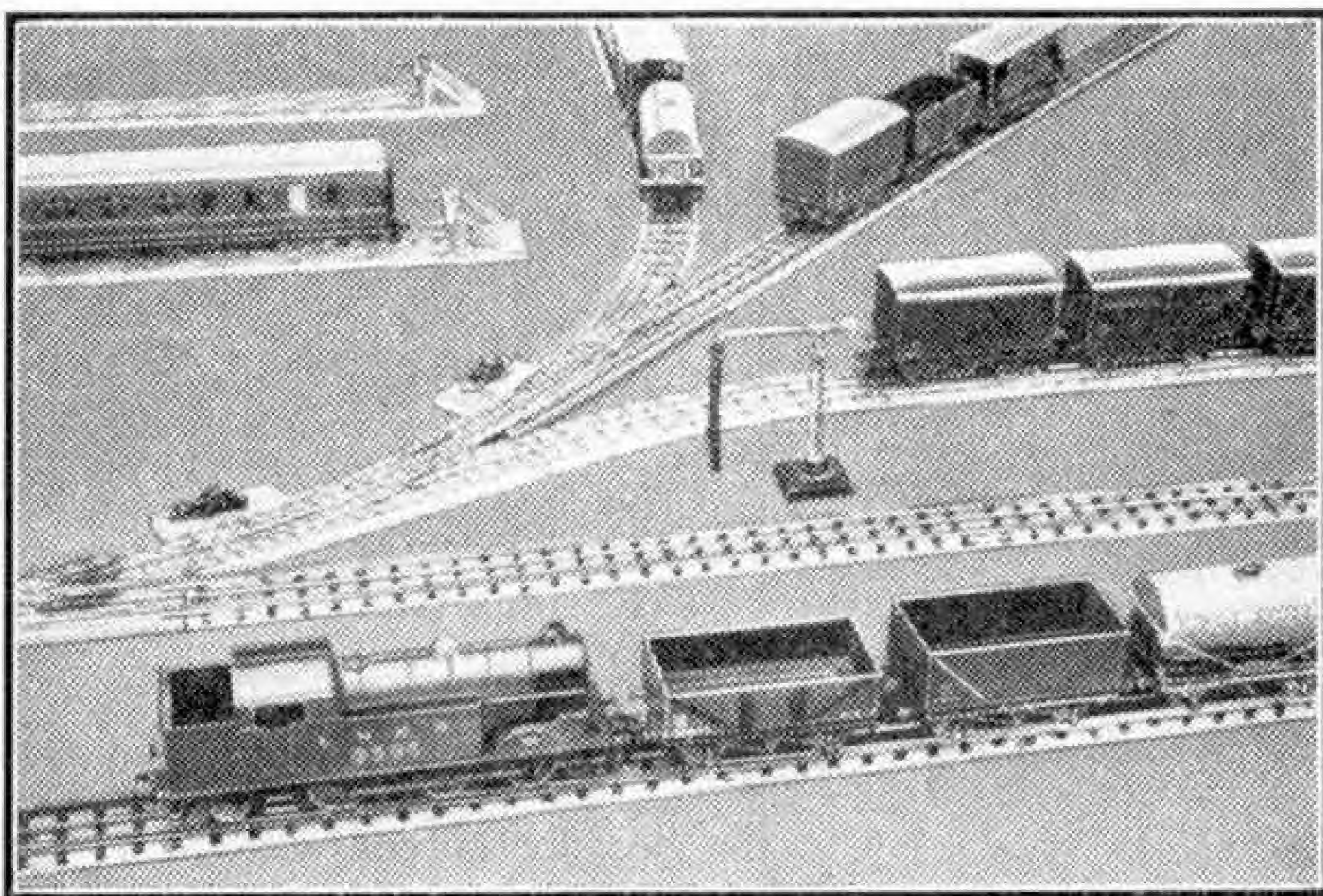
THE Hornby-Dublo owner is usually content at first with running a small goods train made up of several wagons and vans. With the gradual development

long runs on what may be termed residential services. Working of this kind, in addition to the usual "all-stations" stopping train duties, will add to the

variety in operation on a Hornby-Dublo layout. For all passenger train working the Hornby-Dublo owner has to use his standard main line corridor Coaches. This is not usually objected to, as corridor stock does appear on stopping train services in actual practice.

A stopping train is frequently made use of in order to convey any odd vans that are to be worked down the line, possibly to a junction where they may be taken on by main line trains. A Hornby-Dublo Horse Box or any of the standard vans can be run in this way. The manoeuvres necessary for the attachment of such vehicles

to the train, either at the tail end or possibly "inside the engine," may provide one or two operating problems. Similarly the detachment of such vehicles at a later stage in the working may require careful consideration of the position of the Uncoupling Rail. More than one of these Rails may be required and on a system with several engines Isolating Rails will be necessary as well.

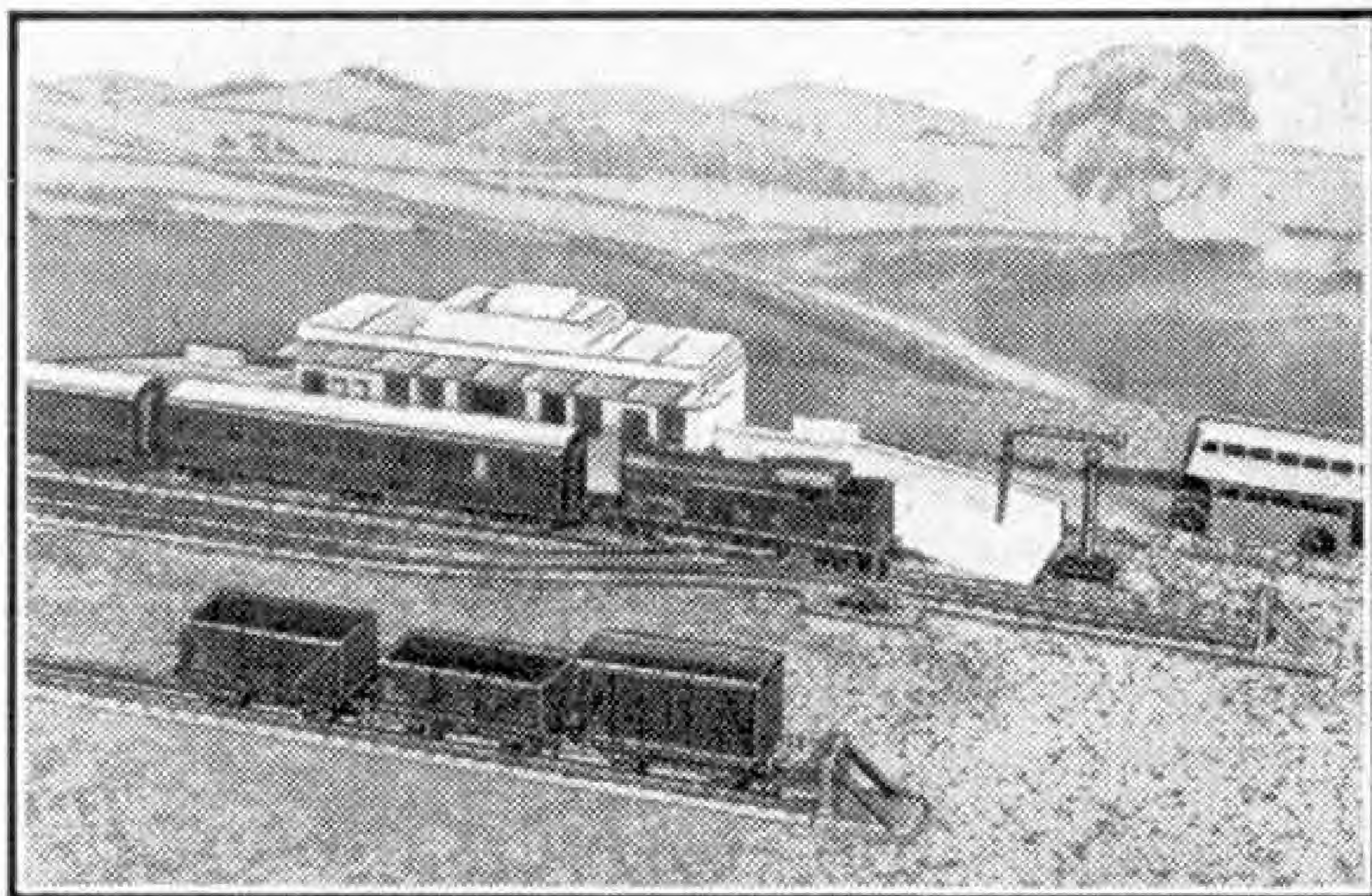


A Hornby-Dublo Tank Locomotive on a mixed goods train. This is the type of duty for which this engine is widely used.

of the layout and the addition of further rolling stock it becomes possible to run a wider variety of trains. There is plenty of fun in working the vehicles round the layout and altering their formation by carrying out simple shunting operations at the goods yard or siding. This kind of working resembles the operation of a real pick-up goods train, which works from station to station and picks up any waiting vehicles and leaves behind others.

For this type of operation the Hornby-Dublo Tank Locomotive is very suitable. Even on the main line the Tank Locomotive can still be used for working say a through train of coal wagons, or a train consisting of vans only. Both kinds of trains are frequently seen in actual practice, and on shorter-distance main line runs a tank engine may be the regular motive power.

Passenger train working provides many operations for which the Hornby-Dublo Tank can be used, and real tank engines appear on fairly



A passenger train headed by a Hornby-Dublo Tank arrives at a branch terminus. Note the loop line for running round purposes.

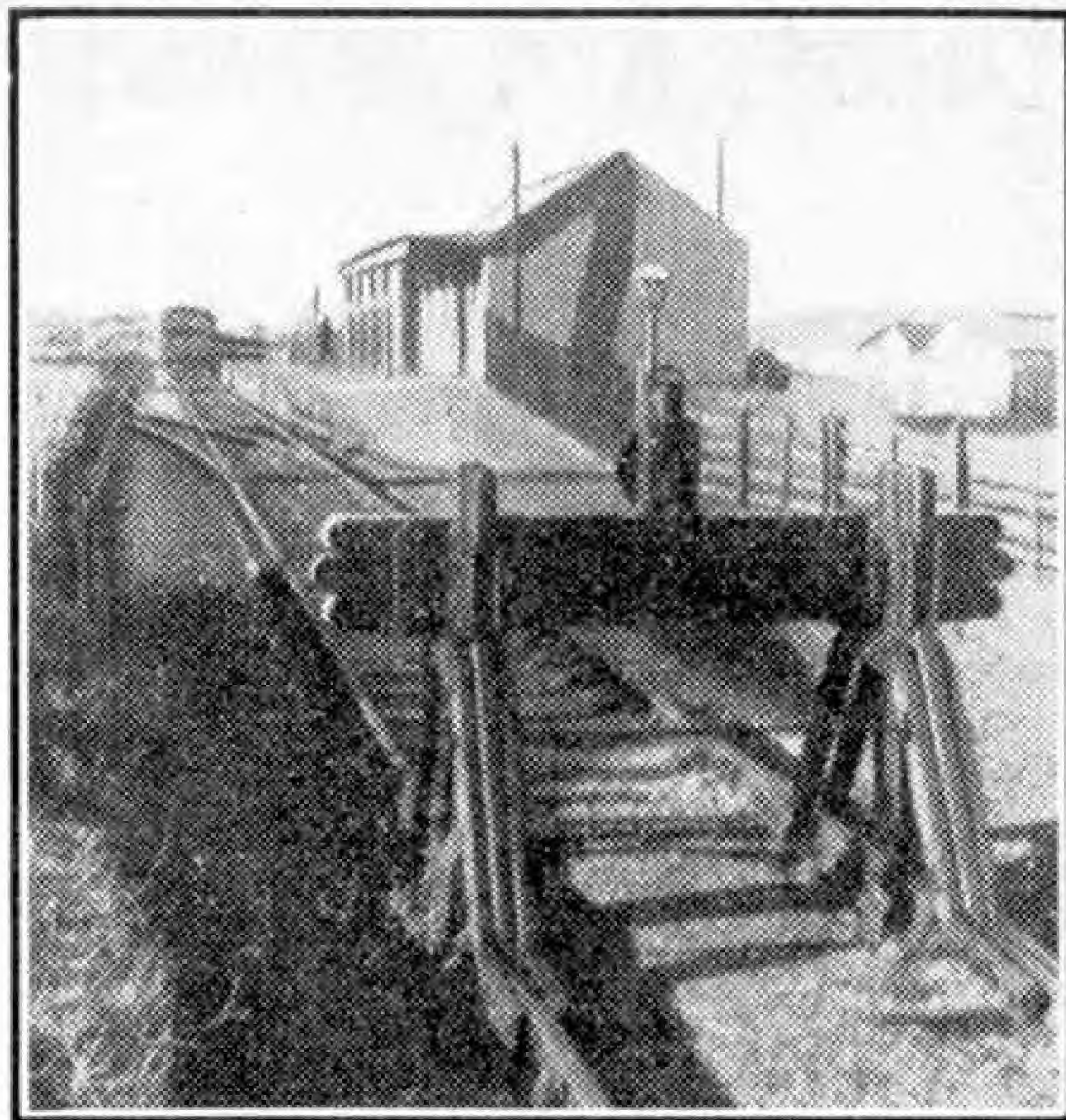
End of the Road

The Hornby-Dublo Buffer Stop

THE buffer stop is a familiar item of railway equipment and a buffer stop is an early requirement in the development of a Hornby-Dublo layout. Each siding requires one for we must provide means for pulling up any vehicle that has been shunted a bit too vigorously.

The Hornby-Dublo Buffer Stop is a neat accessory, well in keeping with the other components of the system. The actual buffer beam, which carries working spring buffer heads, is a single die-casting and this is attached to a supporting trestle-like framework that with the base forms another one-piece casting. The cross-member of the framework to which the actual buffer beam is fitted carries a dummy lamp with the usual red "glass."

To allow the Buffer Stop to be attached to the track the front of the base of the accessory is shaped to receive the centre rail clip and running rail fishplate that project from the end of a Dublo Rail. To correspond with the fishplate there is a small ledge or projection on the base of the Buffer Stop that fits on the end of the rail base. In order to keep the whole thing secure there are a couple of hook-shaped spring wires projecting from the front of the Buffer Stop base. These are intended to pass inside the hollow of the track base and the backs of the "hooks" spring into slots provided for them in



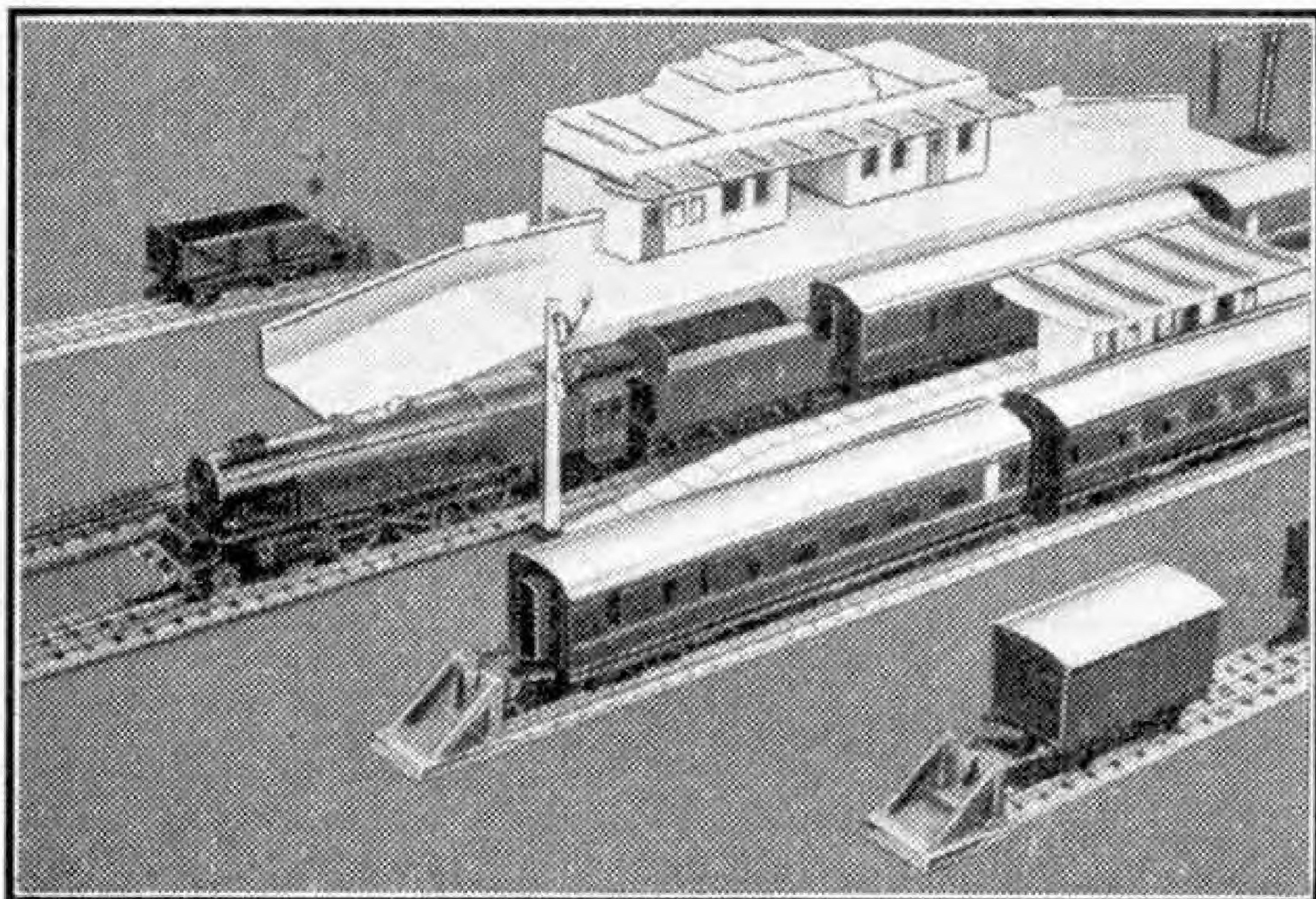
The end of the road. This photograph, showing the buffer stop at Leysdown on the now closed Sheppey Light Railway, was taken by "M.M." reader T. C. Bryant, Minehead.

the rail base sides. These slots are provided at one end only of each EDB1 Straight Rail and EDB1½ Straight Half Rail. So matters should be arranged that each siding ends with one or other of these rails, with its slotted end outermost.

In the ordinary way a Buffer Stop attached as described will be kept in place and will withstand the shock of a vehicle being shunted against it. When it is necessary to dismantle the track, the "hooks" are sprung out of the slots and the Buffer Stop and the Rail to which

it has been attached are then drawn apart. On a permanent layout it may be considered desirable to anchor the Buffer Stop by screwing it down to the baseboard. A screw hole for this purpose is provided in the base.

Sidings ending in a curve should be avoided in miniature, as the buffers of vehicles running on them would not meet the Buffer Stop squarely, and a derailment might result. For this reason Hornby-Dublo Curved Rails and Curved Half Rails have no slots for the attachment of the spring wires of the Buffer Stop.



Hornby-Dublo Buffer Stops in use at the end of rolling stock sidings near the Island Platform and Through Station.

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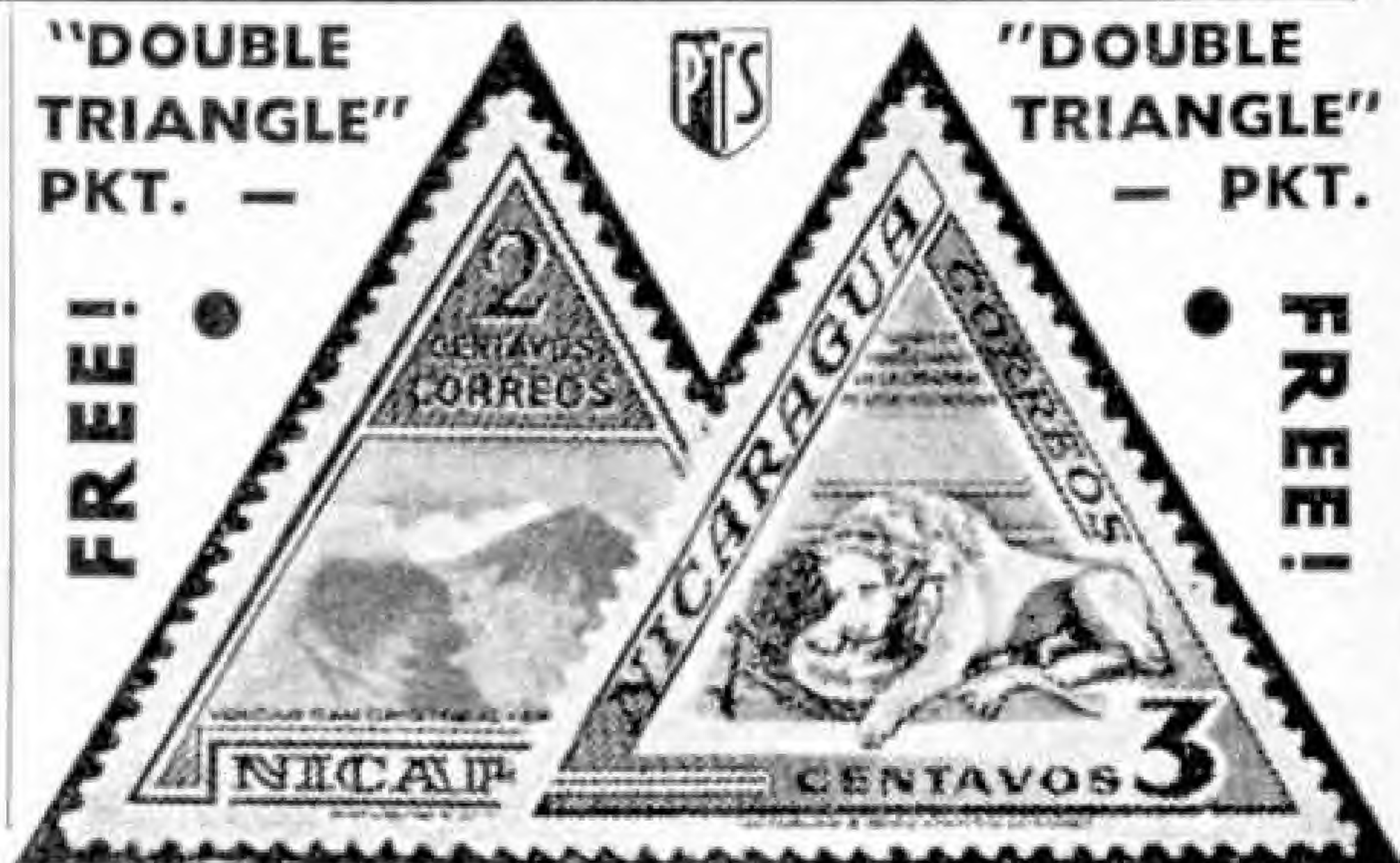
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Kent

For other Stamp Advertisements see also pages 138 and xv.

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FREE!



"DOUBLE TRIANGLE" — PKT.

FREE!

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Stamp Collecting

Butterflies from Switzerland

By F. Riley, B.Sc.

IN the "M.M." for last December I referred to the coming Pro Juventute issue from Switzerland, the four pictorial designs of which were to show two butterflies, a moth and a bee. This set of five stamps duly appeared on 1st December and they made an instant appeal to collectors. They were printed by the famous Swiss firm Courvoisier, and are really attractive. This can be seen from their reproductions



on this page, although necessarily these are in black and white. The excellent use of colour adds very greatly to the splendour of the pictorials, which were printed by the photogravure process.

The Pro Juventute series, to which these stamps belong, are well-known Swiss annuals. They are stamps genuinely used for postal purposes, but in each case there is a small extra charge, the

proceeds of which are devoted to the charitable work of benevolent societies in Switzerland. The designs are always distinctive. For the past few years their subjects have been Swiss wild flowers, the successive series forming a delightful little collection.

The general practice is to issue four pictorials, with a portrait stamp showing some Swiss worthy on the lowest value. Accordingly the 5c. stamp of the 1950 issue, which bears an extra charge of 5c., portrays General Theophil Sprecher von Bernegg, who was Chief of Staff of the Swiss Army during the period of the first World War of 1914-18. The portrait no doubt is an excellent one, and the stamp, recess printed, is good, but it is rather a drab member of what otherwise is a colourful set.

Turning to the insect stamps themselves, the 10c.+10c. stamp shows the Red Admiral, one of the beauties of the insect world. Most of us have seen this butterfly, for it is quite common in England and can often be seen in our gardens during the late summer and early autumn. It is brilliantly coloured, its velvety black wings, from two to three inches across, having on them broad bands of orange red, and there are white markings towards their tips. The appearance of this attractive butterfly is splendidly conveyed by the stamp, on which it is shown against a light blue background with a nettle, the food plant of its caterpillar, faintly outlined in white. The food plant of the related caterpillar is similarly included in the background of each of the



other butterfly or moth stamps.

The insect shown on the 20c.+10c. stamp will not be familiar to most of us, for although it can be seen over most of Europe and Siberia it is definitely rare here. Those who have seen it will not easily forget it, for its wing span is about four inches. It is a moth, known as the Blue Underwing, and a glance at the stamp shows the suitability of the name,

for it is the lower wings that are blue in colour, with a light blue band curving across each.

The 40c.+10c. stamp brings us back to the butterflies, and here again the one shown, the Sulphur Butterfly, is not likely to be known to many readers, as it does not occur in Great Britain. It is a European insect, nearly two inches across the wings, and it seems to be a relative

of our most common butterfly, the Cabbage White, which is responsible for so much damage in our gardens.

Lastly, on the 30c.+10c. value, we have the Brown Bee shown against a beehive cell design in white on a mauve background. Unlike the ordinary Honey Bee, this insect has no yellow stripes, but it is as industrious, producing dark brown honey from the nectar of the alpine flowers it favours.

Butterflies, moths and bees on stamps are comparatively new. There has been one interesting previous example, the astonishing insect shown on the 1c. value of the Sarawak issue of January of last



year. I have reproduced this stamp for comparison with the new set. This also is in colours, black and green, but it is printed by the recess process, and is not so brilliant as the new Swiss stamps. The butterfly itself, the scientific name of which is *Troides Brookiana*, is larger than any of the similar insects of the Swiss collection, for its wing span is six inches. Its wings are of unusual shape, however, and their colouring of

black and vivid metallic green gives it a very striking appearance.

The appearance of the Swiss set may create a new fashion in pictorials, to rival flower stamps, for which there has been so much enthusiasm in the last few years. If future butterfly or moth stamps from other countries are as well produced and as finely coloured as this set the result will be bright additions to the albums of those who specialise in pictorials.

Another interesting possibility is the appearance of more stamps on which insects generally are shown. Almost all the more important



animals have already been pictured by stamp designers, and many birds have achieved this distinction. Insects have been comparatively neglected, however, presumably because in general they are small and cherished by comparatively few. For instance, it is difficult to summon up enthusiasm for a mosquito, so it is not surprising to learn that enmity to this dangerous insect is responsible for its only appearance on a stamp, the Mexican anti-malaria issue of 1939. A more pleasant example is the 1930 set from the Lebanon Republic, which shows the larva and cocoon of the silkworm, and the moth itself.

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Stamp Gossip and Notes on New Issues

By F. E. Metcalfe

FOR a long time collectors have known that most of the West Indian possessions were to adopt the dollar unit for their currency, and that this would entail a change in their stamps. It is now clear that not all will make the change. Apparently



the important colony of Jamaica is to stay put, for the time being at any rate, but Grenada has taken the plunge and our first illustrations this month are of stamps from the new set, made necessary by the monetary change, which was issued 8th January last.

Dominica is to be the next country to make the change, and then Virgin Islands, Turks and Caicos Is., etc., will not be long in following suit. All this

means plenty of new issues for K.G.VI collectors, but they don't seem to mind. As a matter of fact they seem to revel in them and dealers who only sell stamps of the present reign seem to be busier than ever. Of course the step taken by our Crown Agents in opening a selling agency in Washington, U.S.A., is helping, and bit by bit our Commonwealth stamps are becoming almost as popular in America as they are at home. Even the new K.G.VI catalogue is having record sales over the water, which is unusual, for hitherto American collectors have been content with their own "Scotts." Strangely enough, this is now published by a British firm of stamp auctioneers, and a right good job they are making of it too, although there was certainly plenty of room for improvement.

Readers know that about the middle of the year Fiji is to bring out two "Health" stamps, for a charity somewhat similar to the one which the New Zealand "Health" stamps serve. It was rumoured that India was to follow suit, but apparently this latter country has abandoned the idea for the time being, though any scheme that would bring some happiness to many of India's children was surely to be welcomed.

Several collectors have mentioned that they have recently received letters with stamps stuck on the envelopes that have not been cancelled, and they don't seem to know what these are. Well those that were sent for identification were all what are known as Christmas seals. They have more or less the same object as the stamps we have just been discussing, though they are not exactly postage stamps themselves.



South Africa, Australia, Denmark, etc., have been bringing out Christmas seals for many years and the proceeds all go to charity. Those of South Africa are printed in English and Afrikaans alternately, like their postage stamps. Similar seals are being produced at home now, so we may get seal collectors in Great Britain, as

there are abroad.

And now to leave stamps

and seals for a moment, what about albums? Those who are in need of one had better set about the job of purchasing it as soon as possible, and don't overlook extra leaves, if they are needed, for the paper situation is bad.

Readers will have noted that a number of Australian stamps are being changed to coincide with the altered postal rates that have recently come into operation in that country. This is one of the few occasions when stamp changes need not set collectors into a scurry to get the old stamps before they go up in price. It is true that mint specimens will go up slightly, but there will be no spectacular rises. Used are never likely to cost more than a copper each, with the exception of the 8½d. value, which is now rendered redundant, and according to information received will not be reprinted.

Australia's stamps of the present reign are in a rare jumbled up state and almost beyond fitting into regular sets. Latterly some of the designs have been as attractive as they have been apt, and they

have a great following among junior collectors, as well as among more advanced collectors, because they can be picked up cheaply. Attention has previously been drawn to the collecting of modern Dominion stamps in a used state, and those of Australia form an attractive part of such a collection.

A reader has written about a set of Colonial "U.P.U." stamps, which he states was given to him as a

birthday present. He wants to know if he should sell it, as he has permission to do, and invest the proceeds in other stamps, or should he hang on to the set purely from an investment standpoint. Well, it is fairly easy to give an answer, for there can be few stamps on sale that are more likely to rise in price than this set. Moreover it will be quite easy to obtain a buyer, if the set is kept in perfect condition, but unless one knows the ropes very well, no stamps can be considered the best medium for investment and they are better left alone altogether if that is the only appeal which they have.

"Silver Wedding" stamps have been rather in the news lately, for a dealer who proposed to take some out of the country had them seized by the Customs authorities, who for some unaccountable reason decided that these stamps should be put up for auction in the "U.S.A." Details of prices obtained are now to hand. Sheets of 60 stamps brought the sum of \$8,750, but how shabby it all looks, taking such things over to another country just to obtain a handful of currency.

Our authorities are very much alive to the dollar earning possibilities of colonial stamps. According to official figures, sales for the first six months at the agency opened some time ago in Washington totalled £14,595, about a twentieth of the London sales.



Competitions! Open To All Readers

*Prize-winning entries in "M.M." competitions become the property of Meccano Ltd.
Unsuccessful entries in photographic, drawing and similar contests will be returned if
suitable stamped addressed envelopes or wrappers are enclosed with them.*

A Price Code Contest

Many readers must have noticed that in stores of all kinds the little price tickets attached to articles on display often carry letters instead of numbers. These letters are usually taken from a code word, the successive letters of which represent the numbers 1 to 9 and 0. For instance if the word "Buckingham" were used, an article to be sold for 10/6 would be marked BM/N.

This principle is easy to grasp, and this month our first competition is based on it. In the panel on this page the prices of 10 articles are given in accordance with the letters of a code word. The articles themselves have been advertised in recent issues of the "M.M.," and their nature provides clues to the scales of the prices involved. What readers are asked to do is to study the code prices for the various articles and to give the

Radio Receiver	N/R
Developer	R/R
Building Set	ST/N
Scale Model Coach	T/SH/D
Sharpener	U/D
Electric Motor	S/E/R
Repair Outfit	S/S/D
Hobby Outfit	U/SU/R
Something good to Read	SD/R
Fixes Things	T/R

actual figures. When this is done it will be found that the code word used is the name of a county in the British Isles.

There will be the usual sections in this competition, for Home and Overseas readers respectively, and in each of these prizes of 21/-, 15/- and 10/6 will be awarded for the best entries in order of merit. If there is a tie for any prize the judges will base their awards on the novelty and attractiveness of the entry itself. Consolation Prizes will be awarded for entries that do not quite reach the prize-

winning standard. Do not forget to give your full name and address on your entry.

Entries should be addressed "Price Code Contest, Meccano Magazine, Binns Road, Liverpool 13." The closing dates are 30th April in the Home Section and 31st July in the Overseas Section.

A Railway Station Scene

Many readers of the "M.M." are keen railway enthusiasts and enjoy visiting the nearest railway station or junction to keep an eye on locomotive workings, and to watch the busy scenes on the platforms as well as the varied activities on the main lines and in the sidings. For our competition this month we ask readers to imagine that they are in just such a station on a busy Saturday afternoon, and to tell us about the scene. Often there are humorous episodes or little homely happenings to write about, as well as the arrival and departure of trains. These add real interest to the story, and help us to realise how much our railways are part of our lives to-day.

It does not matter whether the station described is one of the great termini or junctions, or is just a branch line station away in some rural area or at the seaside. Its size and importance will not matter to the judges, who will be interested only in the railway workings and the lively station scenes described in the entries.

The competition will be divided into two sections, as usual, for Home and Overseas readers respectively, and prizes of 21/-, 15/- and 10/6 will be awarded for the best entries in order of merit.

Entries should bear the full name, address and age of the competitor, and descriptions should be written on one side of the paper only. They should be addressed "March Railway Contest, Meccano Magazine, Binns Road, Liverpool 13." Closing dates: Home Section, 30th April; Overseas Section, 31st July.

March Photographic Contest

The third of our 1951 series of photographic contests is a general one, in which we invite readers to send in prints of any subject. There are only two conditions—1, that the photograph must have been taken by the competitor, and 2, that on the back of each print must be stated exactly what the photograph represents.

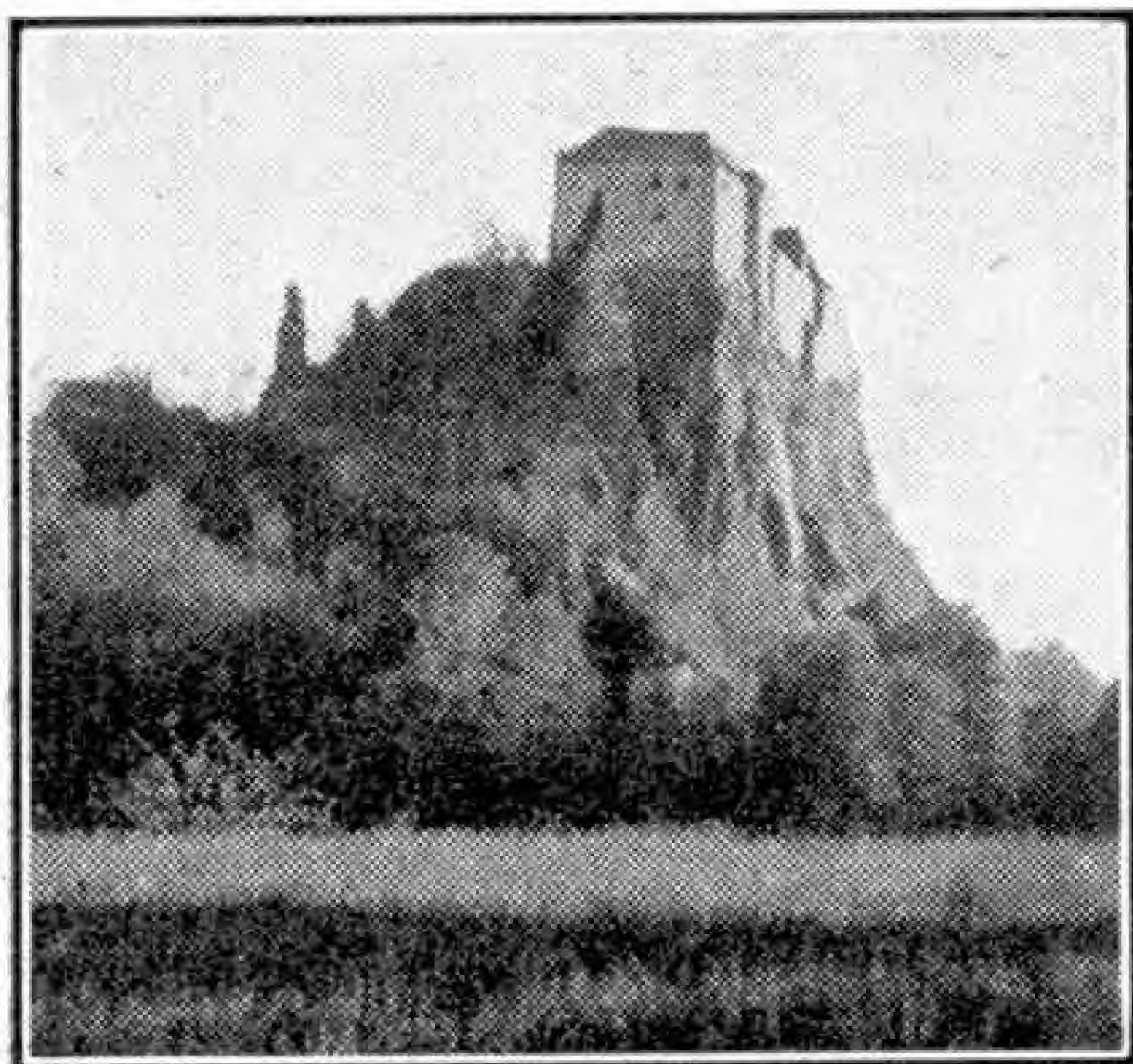
The Competition will be in two sections, A for readers aged 16 and over, and B for those under 16. Each competitor must state in which section his photograph is entered. There will be separate Overseas Sections, and in each section prizes of 21/-, 15/- and 10/6 will be awarded. Entries should be addressed "March Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13." Closing dates: Home Section, 31st March; Overseas Section, 30th June.

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

A FAMOUS STYRIAN STRONGHOLD

On a school outing last summer we visited the Riegersburg, a magnificent fortress in the hills in the east of Styria, the southern province of Austria. After a two hours' coach ride we saw a high rock towering up in the distance, and when we came closer the castle with its mighty grey walls rose before us as if it were the summit of the rock itself. It is beautiful to see from afar how the mountain rises like a cliff from the sea, and on approach the "breaking sea" changes into waving corn-fields.



The Riegersburg, a great fortress built on a rock in Styria, Austria. Photograph by W. H. Mayr, Graz.

Long, long ago there was an active volcano on the site. Now the fortress stands on the former crater and is an imposing site high up on the margin of the vertically falling rock. On the other side of the fortress the road leads upward through gateways and arches that are reminders of the old fortifications of the stronghold. On this road, hewn in stone, are the tracks of the coaches in which the owners used to go up and down the hill. In front there is a small so-called donkey path. At one time there were two fortresses on the mountain, but one of these has fallen into decay.

The castle as it is to-day was completed and fortified about the middle of the seventeenth century. This task was planned by a woman who possessed a special gift for architectural work. A proof of how powerful an impression the fortress made in former times is that the Turks, who were not easily frightened, never ventured to attack it. When they invaded Lower Styria the farmers of the neighbourhood took refuge in the fortress, which was prepared for any siege. It was indeed a castle of refuge. Three big rooms filled with peasants' weapons such as clubs and flails can still be seen.

The castle suffered much from the last period of the recent war, but most of the damage has been repaired. Many old spears, daggers and other weapons are kept in it as well as old pictures, and the artistic inlaid work on the doors and the ceilings is well worth seeing. Looking out of the windows, surveying as it were from an eagle's nest the land beneath as far as

the Hungarian Lowlands and Yugoslavia, it is easy to realise that in former times the owners of this stronghold were the masters of the countryside.

W. H. MAYR (Graz, Austria).

BATH CHAIRS

The city of Bath has been famous for its hot springs since Roman times, and the waters of these have valuable curative properties. It has long been known as the home of the wheeled chair for elderly invalids. Until about 1940, when the chairs became extinct in the city, people who had come to the Spa for treatment at the baths could hire these to take them to places like The Royal Victoria Park, the Royal Crescent and the Parade Gardens, where they could listen to the band.

Here are the conditions under which the chairmen could practise more than 150 years ago, as set out in "The New Bath Guide, 1780." They had to pay 3s. for a licence.

"No chairman can demand for any one fare more than the sum of sixpence, or to any place not exceeding the distance of 500 yards more than sixpence and for any greater length not exceeding one measured mile or 1,760 yards, the sum of one shilling and no more than sixpence for every half-hours' waiting, and so proportionately for any longer space of time."

The accompanying illustration shows a Bath Chair in the Abbey Churchyard.

C. G. MAGGS (Bath).



A Bath Chair in the Abbey Churchyard, Bath. Photograph by C. G. Maggs, Bath.

The Last of the Ivatt "Atlantics"—*(Continued from page 121)*

and her immaculate appearance recalled my first encounter with a G.N.R. "Atlantic." It was in 1909 at the Imperial International Exhibition at Shepherd's Bush. There, as a very small boy, I can recall being shown on to the footplate of No. 1442 and being allowed to peer into the fire-box which was, I think, lit up electrically for the Exhibition. No. 1442 was for years the Royal Engine on the G.N.R. and was shown at the Exhibition with old No. 1, the first Stirling "eight-footer."

The "Atlantics" have always been well known far beyond the limits of their original system. The G.N.R. featured an "Atlantic" on many of their posters and train announcements at different times. On some of the earlier efforts the admittedly large boiler was made to appear a truly colossal affair, but in later days technical accuracy in this respect was improved. Naturally an "Atlantic" was pictured on one of the popular official G.N.R. locomotive postcards, which, incidentally, cost only two-pence for the set of six in those spacious pre-1914 days!

For years an "Atlantic" was sure to be found in any picture book of trains, as well as in more serious publications dealing with railways. I can recall an "Atlantic" as one of the subjects in a set of picture blocks of the kind once to be found in almost any playroom. Inevitably an "Atlantic" would be featured in any "Railway Race" games of the time, and much more recently I have read of an accurately depicted "Atlantic" figuring on an inn signboard well away from the engine's parent system.

Naturally this popularity was reflected in the number of models, clockwork, electric and steam, based on the "Atlantic" design, which was only rivalled by the numerous versions of L.N.W.R. "Precursor" once available. At one time indeed one could buy a miniature "Atlantic" in practically any size from Gauge 0 to 2 in. scale; that is to say from one you wound up to one you could ride on.

The River Craft of China—*(Continued from page 108)*

thing beneath our feet.

Four days on that raft were enough. I decided afterwards to stick to dry land or less exciting craft!

I was glad when I eventually left China by boat that a junk or two kept me company over the first few miles. The big junks that sail up the Whangpo and tie up along the Shanghai Bund, or set out to trade or fish from the harbours of Hong Kong, are bigger than their inland namesakes. But with sails aloft against the sky they are every bit as beautiful.

New Meccano Model—*(Continued from page 131)*

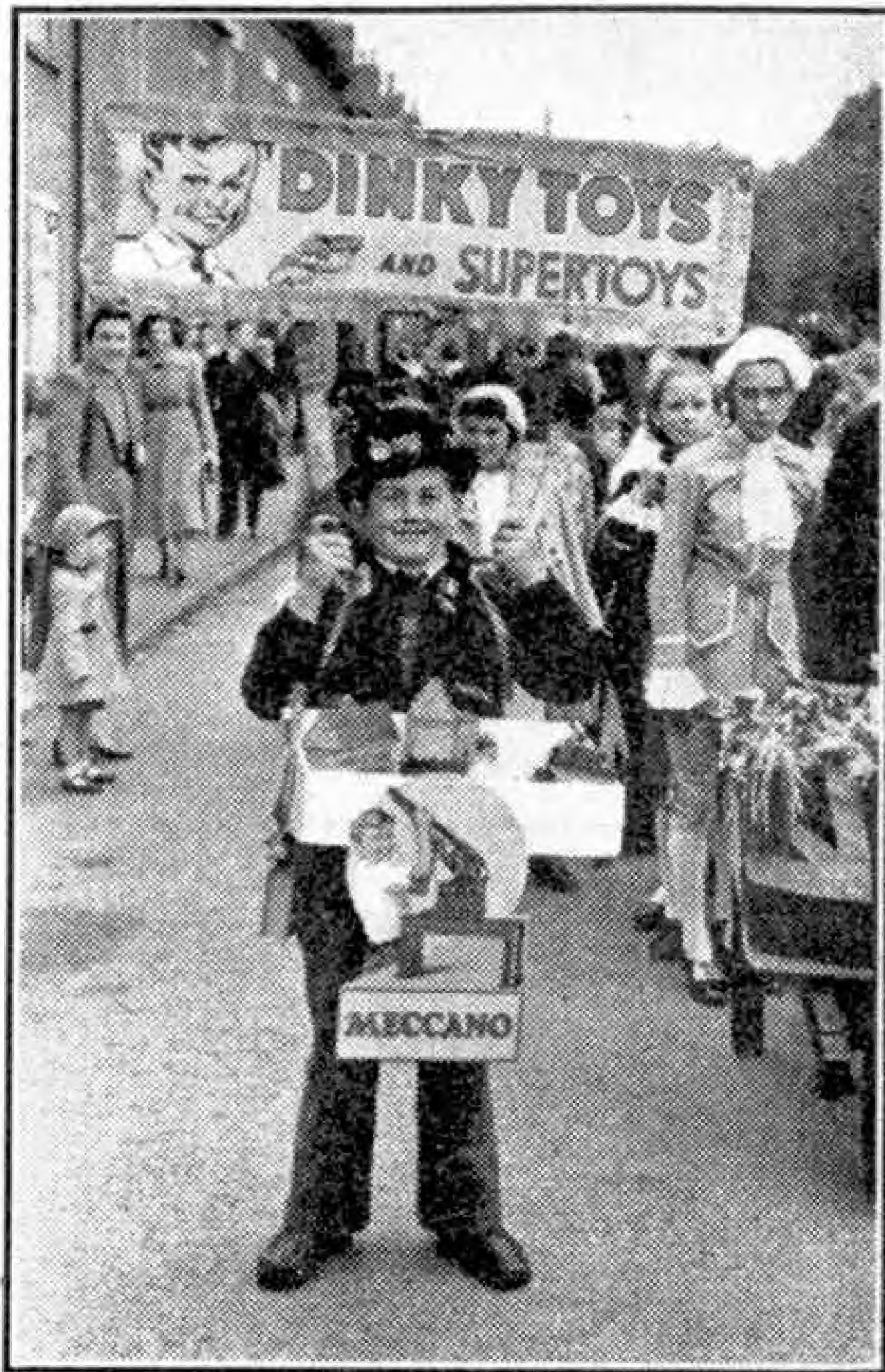
to 6½" Rod 25. This Rod passes through the side of the cabin and through 2½" Curved Strips bolted to Flanged Sector Plates 15. One of the Curved Strips is seen at 26. The Rod carries a ½" Pinion 27, that can be engaged with the 57-tooth Gear on Rod 20. A handle on Rod 25 is provided by a ½" loose Pulley free to turn between two Collars.

The Motor control switch is extended by a 2" Rod 28 held in a Rod and Strip Connector lock-nutted to the switch.

The back of the cabin is completed by two 1½" radius Curved Plates, three 2½" x 2½" Flexible Plates and a 5½" x 2½" Flexible Plate. The top is filled in by Flexible Plates attached to Angle Brackets and to 2½" x ½" Double Angle Strips 29.

A 3" Pulley 30 is attached by ½" Bolts to Flanged Plate 7 and to a Semi-circular Plate fixed to Flanged Plate 8. A Rod passed through Pulleys 30 and 6 is held by a 2" Pulley inside the cabin and a Flanged Wheel beneath the base.

Parts required to build the model Mobile Crane: 6 of No. 1; 17 of No. 2; 6 of No. 3; 2 of No. 4; 6 of No. 5; 4 of No. 6a; 6 of No. 10; 2 of No. 11 15 of



David J. E. Cooper, of Mountsorrel, near Leicester, in the attractive [Meccano [Fancy] Dress with which he has often won a prize at local Garden Fetes.

No. 12; 4 of No. 12a; 10 of No. 12c; 1 of No. 14; 2 of No. 15; 1 of No. 15a; 1 of No. 15b; 2 of No. 16; 1 of No. 17; 2 of No. 18a; 2 of No. 19b; 1 of No. 20a; 2 of No. 20b; 1 of No. 22; 1 of No. 22a; 1 of No. 23; 1 of No. 23a; 2 of No. 24a; 1 of No. 26; 1 of No. 27a; 1 of No. 32; 14 of No. 35; 160 of No. 37; 12 of No. 37a; 9 of No. 38; 1 of No. 38d; 1 of No. 40; 1 of No. 44; 2 of No. 48; 5 of No. 48a; 2 of No. 48b; 1 of No. 51; 2 of No. 52; 3 of No. 53; 2 of No. 54a; 1 of No. 57c; 6 of No. 59; 1 of No. 80c; 2 of No. 90; 1 of No. 90a; 2 of No. 111; 1 of No. 111a; 4 of No. 111c; 1 of No. 116a; 2 of No. 125; 2 of No. 126; 4 of No. 126a; 1 of No. 155; 4 of No. 187; 5 of No. 188; 5 of No. 189; 7 of No. 190; 2 of No. 191; 6 of No. 192; 2 of No. 199; 2 of No. 200; 1 of No. 212; 1 of No. 214; 8 of No. 215; 1 E20R Electric Motor.

Advanced Model-builders' Page—*(Continued from page 128)*

place in the breakwater, and then lowers it as necessary. When the block rests on the breakwater, workmen turn the T-shaped pieces until they are in register with the holes in the block; and the crane again hoisting, the bars are easily withdrawn, leaving the block in position set at the correct angle.

The Meccano version of this gear seen in Fig. 1 functions just like the actual mechanism, and its details are quite easy to follow from the illustration. I would suggest to crane builders that they try out this interesting and instructive addition on their next block-setter, for I am sure the extra work involved will be amply rewarded by the increased effectiveness and interest of the completed model.

Fireside Fun

"What are you sitting on that boy for?"

"He hit me and I'm counting 100 before I hit him back."

"I suppose that ghostly figure gave you a start."

"I didn't need one. I went off before I could get one."



"I've got stewed kidneys, boiled tongue, grilled liver and pig's feet."

"Don't tell me your troubles, just bring me some tomato soup!"

"Yes, my boy, my advice to you is to remember always that time is money."

"Thank you, sir. How many minutes are there in a shilling?"

"And now, these cakes are all home made. Just take your pick."

"Sorry I haven't got one with me. I think I had better have another slice of bread and jam."

"You're afraid to fight, you see."

"No I'm not. I just don't want my dad to know I've been fighting."

"But he'd never know, would he?"

"Yes he would. He'd see the doctor coming to your house."

"Uncle, that sixpence you gave me slipped through a hole in my pocket, and I've lost it."

"Never mind, boy. here's another one."

"Thank you, but wouldn't half-a-crown be better? It would be too big for the hole."



"I wonder why they want my autograph now?"

"Just morbidness, I expect, in case anything happens during the game."

"BRAIN TEASERS" AMONG THE RECORDS

The multiplication sum shown below seems a little curious, especially as no answer is shown, even in letters.

XYZA
BC

XYZA
DFYB

In letters the answer is the name of a well-known firm in the gramophone world. When you have discovered this you should be able to work out the sum in numbers. V.A.D.

SPANNING THE ATLANTIC

Here is something that is really easy, a long line of letters in which the names of five well-known aircraft are hidden: CCSTOOBRRYSKNAAS TTBMERTAEEZNASTCOLRLUANITSIEORM.

Some of these five aircraft are British; the rest are American. What are they? B.V.



"Where's your light?"

"The wind must have blown it out."

"Bit of a gale wasn't it? It's blown your rear lamp away altogether!"

SOLUTIONS TO LAST MONTH'S PUZZLES

In solving our first puzzle last month it was fatal to try to follow the business man. The best way was to follow the chauffeur, remembering that he too saved 20 min. Of this he must have saved half in each direction of his journey, so that he met his employer 10 minutes earlier than usual, that is at 4.50 p.m.

The simple way was the solution also to our second problem last month. The Jester merely rolled the carpet up!

Clearly the number the Professor in our third problem saw was 18, for half of 18 is 9 and 9 multiplied by itself is 81.

Finally our word chains. The first is NECTAR, ARLINE, NECTAR. If you object to using a Christian name for the one link ARSINE can be used instead; it is the name of a poisonous compound of arsenic. Any reader who formed another chain as short as this should let me know.

The chain of 13 words, with ESTEEM in the middle is NECTAR - ARREST - STANCE - CENTRE - RESIGN - GNOMES - ESTEEM - EMPIRE - RESUME - MEDDLE - LEADER - ERMINE - NECTAR.

*You'll
never catch
REG HARRIS*



*riding
anything
but*

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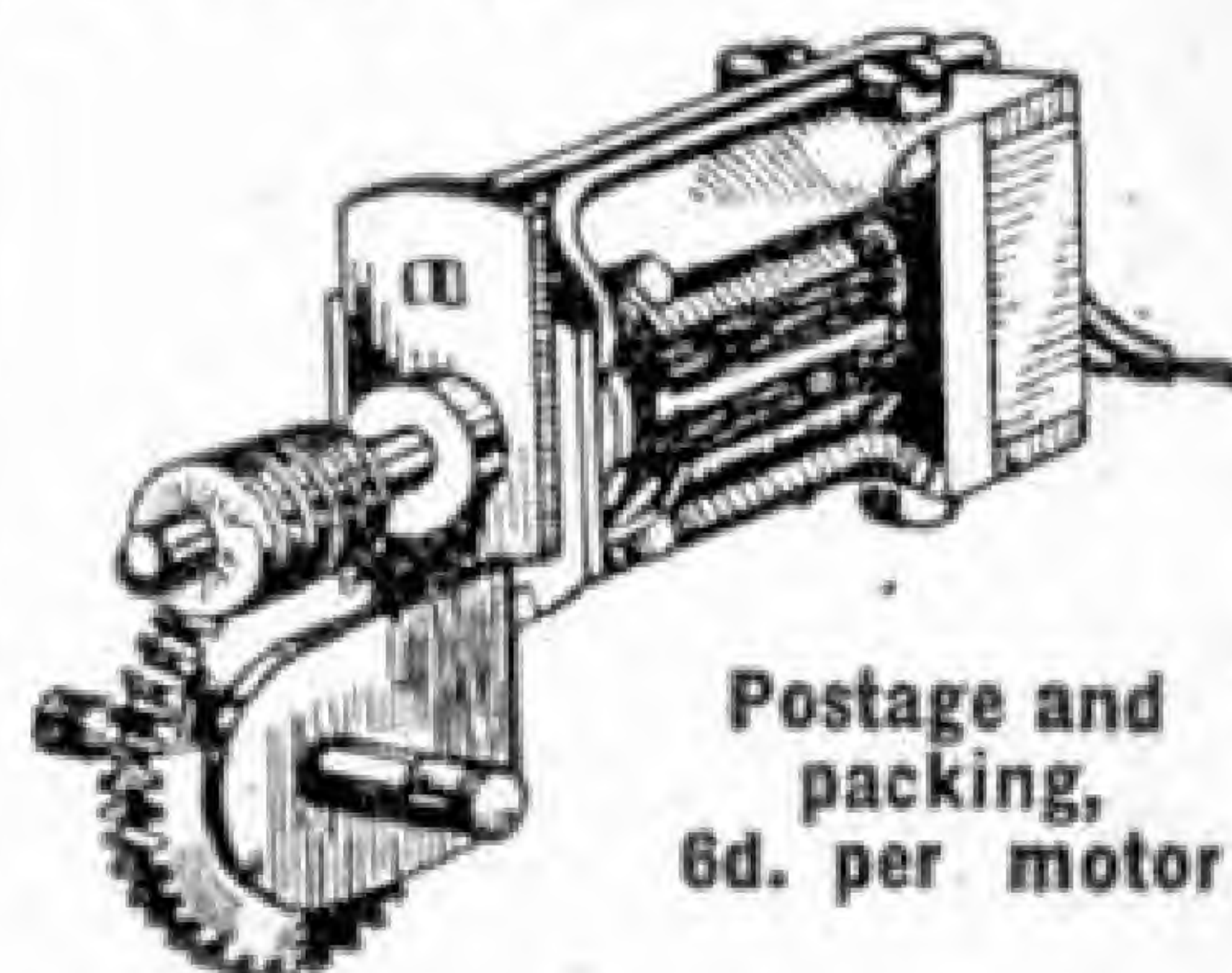
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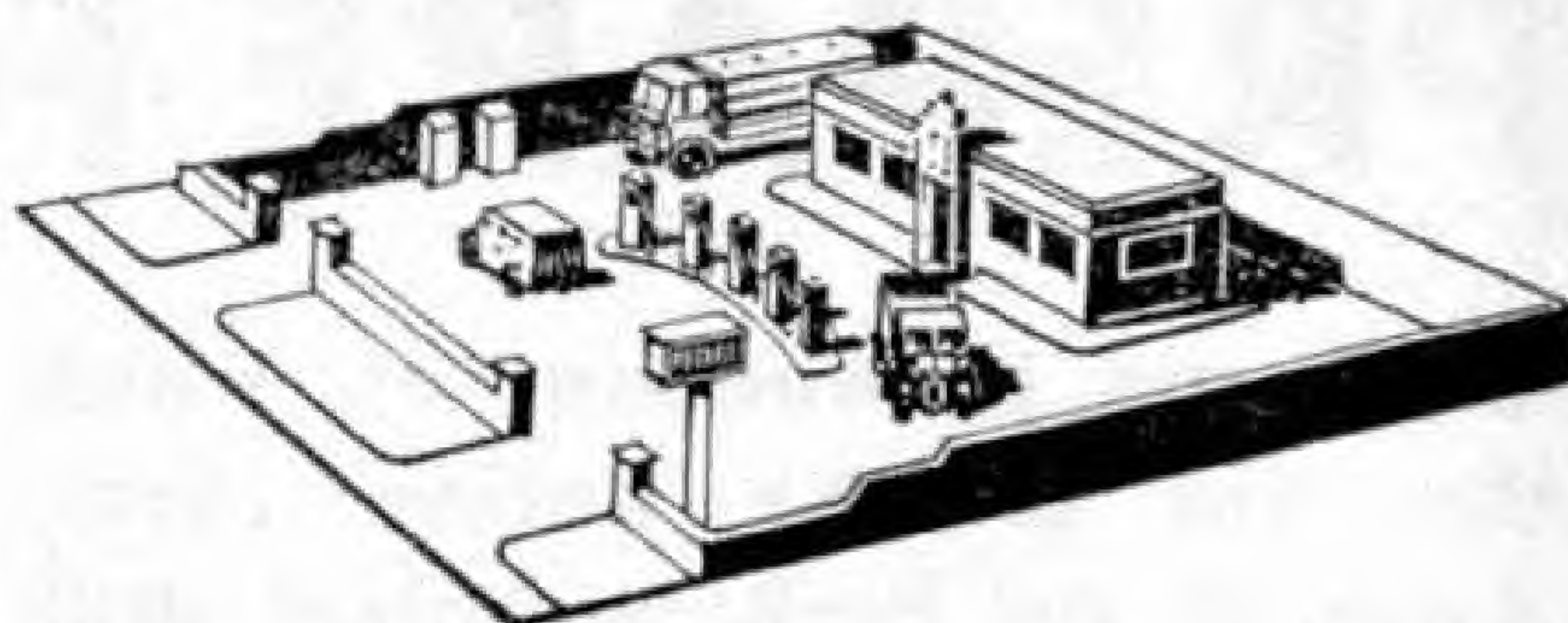
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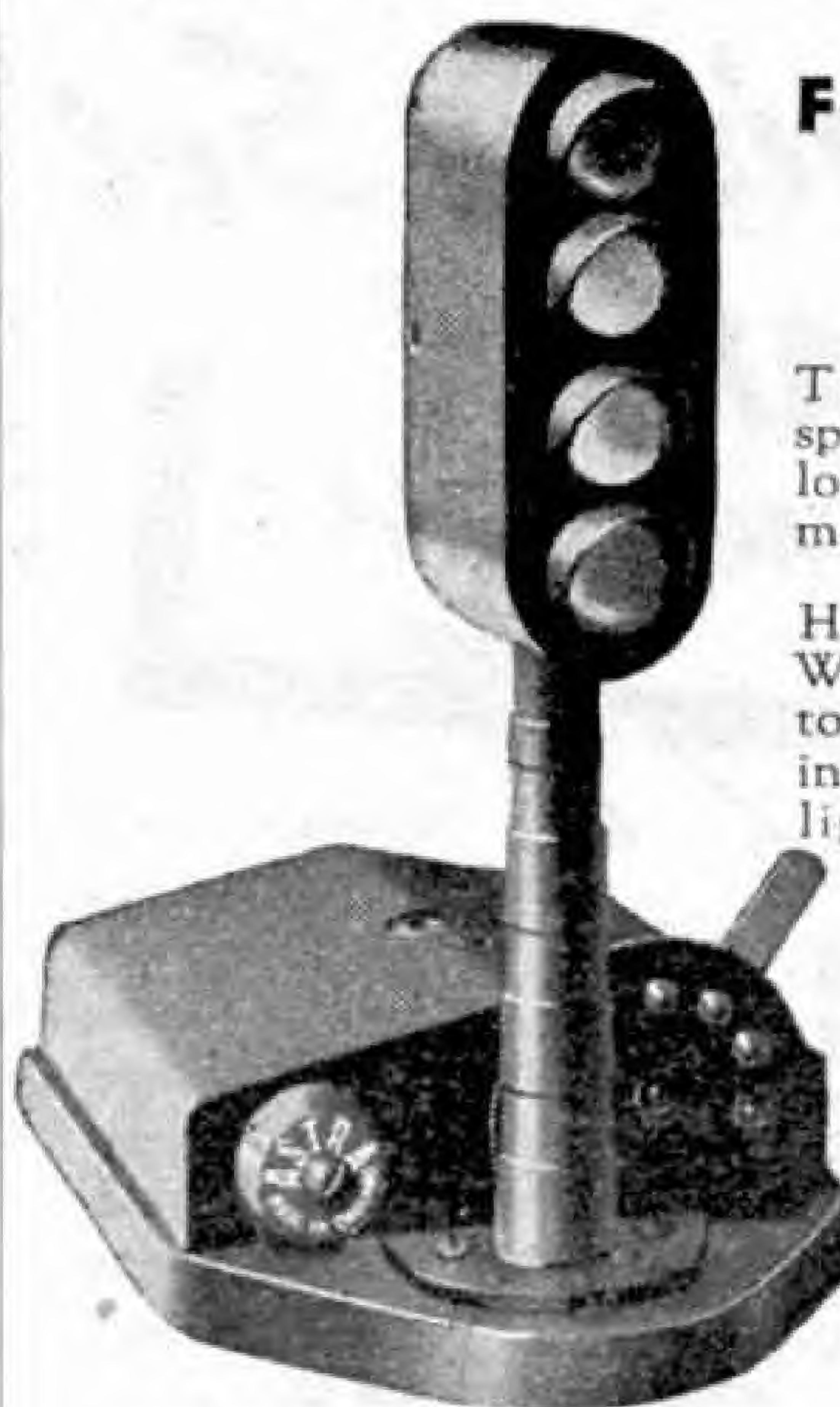
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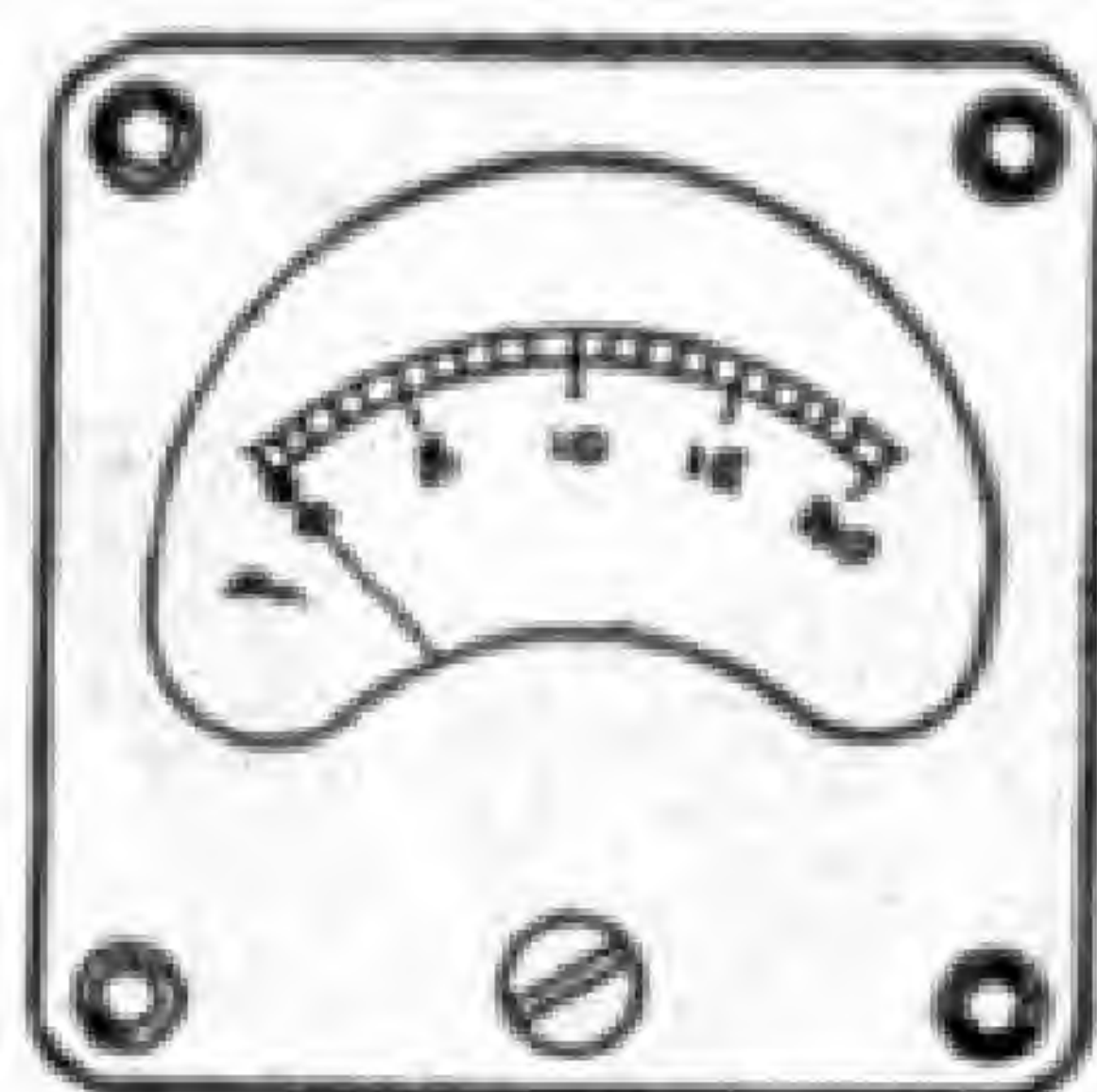
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